

CANADIAN FARM
YEAR
BOOK
1914



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TORONTO

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Separator

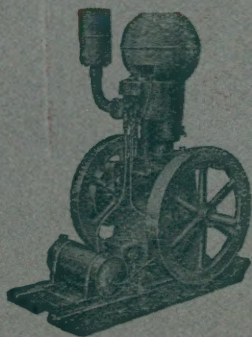
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J. C. Boyle
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CANADIAN FARM YEAR BOOK

1914

A Complete Reference Library and Hand Book
for the Farmer and Stockman

Compiled Under Direction of
Editorial Staff of
CANADIAN FARM

THE FARM PRESS, LIMITED

12 East Wellington St.

Toronto, Ont., Canada

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Toronto, Ont.

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INTRODUCTORY

THE second issue of Canadian Farm Year Book, presented herewith, is an entirely new edition. Matter from the 1913 Year Book has been recast and presented in new form. In addition, a great deal of new matter has been compiled, and the book in its 1914 form is, we sincerely believe, of very much greater value than the first edition. Our experience with the first edition has shown the weak points and where improvement was needed and where the Year Book could be made to serve in a more effectual way the farmers of all Canada.

The material which the Year Book contains has been gathered from many sources, involving a large amount of research. The information it contains has been compiled and condensed from the best authorities in agricultural practice in Canada and other countries. This information is presented in condensed form and, as far as possible, conveniently tabulated. The new edition is better illustrated than the former one and in every way is a more complete compendium of useful and practical information needed on every farm.

This second edition is presented with the hope that it will meet a long-felt need in the farming community. While the work involved has been strenuous and long continued, we feel amply rewarded in being able to present an encyclopaedia of reliable information that has not heretofore been attempted in the field of agriculture.

THE EDITORS.

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Canadian Farm Year Book

1914

THE DOMINION.

The Parliament of the Dominion of Canada consists of the Senate, with 87 members, and of the House of Commons, with 221 members, senators being appointed for life by the Governor-General, and members of the House of Commons being elected by the people. The limit of duration for each Parliament is five years. A Redistribution Act passed after each census readjusts the number of representatives in the House of Commons in accordance with rules laid down in Section 51 of the British North America Act, 1867, of the Imperial Parliament (30-31 Vict., c. 3). These rules provide that the Province of Quebec shall always have the fixed number of 65 members and that there shall be assigned to each of the other provinces such a number of members as will bear the same proportion to the number of its population (ascertained by the census) as the number 65 bears to the population of Quebec.

The four original provinces of the Dominion were Ontario, Quebec, Nova Scotia and New Brunswick, which were given parliamentary representation according to Section 37 of the British North America Act, 1867. By Imperial Orders in Council the provinces of British Columbia and Prince Edward Island were admitted into the Dominion—the former on July 1, 1873, by Order dated May 16, 1871, and the latter on July 1, 1873, by Order dated June 26, 1873. An Act of the Dominion Parliament of May 12, 1870 (33 Vict., c. 3), provided for the formation of the province of Manitoba out of Rupert's Land and the Northwest Territory, so soon as these should be admitted into the Dominion of Canada, which admission was effected by Imperial Order in Council, dated June 23, 1870, and taking effect on July 15, 1870. In consequence of doubts as to the legal validity of the Dominion Act of 1870 (33 Vict., c. 3) the Imperial Parliament passed an Act in 1871 (34-35 Vict., c. 28) making the Canadian Act valid and effectual.

Area and Population.

The Dominion of Canada, extending westward from the Atlantic Ocean to the Pacific Ocean, and northward from the United States boundary into the Arctic Circle, embraces a total area computed at 3,729,665 square miles. This area is divided into nine provinces and the Yukon and Northwest Territories. By the Boundary Extension Acts, passed by the Dominion Parliament in 1912 (2 Geo. V. cc. 32, 40 and 45) the provinces of Manitoba, Ontario and Quebec were enlarged by the addition of areas that were previously part of the Northwest Territories. The boundaries of Manitoba were thus extended northwards to the 60th parallel of north latitude between the eastern boundary of Saskatchewan and the western shore of Hudson Bay; and from the point where the northern boundaries of Manitoba and Ontario formerly coincided the boundary of Manitoba was extended due north to a point defined and thence north-easterly to the point where the 89th meridian of west longitude intersects the southern shore of Hudson Bay. The northern boundaries of Ontario were extended to the southern shores of Hudson Bay, the new western boundary of Ontario coinciding with the new eastern boundary of Manitoba. To the province of Quebec were added the whole of the territory of Ungava and that part of Labrador which is within the Dominion of Canada.

Additional Territory.

By the revision of the boundaries Manitoba received about 178,100, Ontario 146,400 and Quebec 354,961 square miles of additional territory.



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Street, Toronto.*

Quebec, instead of British Columbia, is now the largest province of the Dominion, Ontario being second, and British Columbia third in point of size. The map of Canada which forms part of this volume shows clearly the present boundaries of the provinces.

New District.

The new district of Ontario has been named Patricia. It is bounded on the west and northwest by Manitoba, on the south and southeast by the English and Albany rivers and on the east and north by James and Hudson Bays. Pursuant to an Order-in-Council, dated February 20, 1912, and subject to the future enactment by the Dominion Parliament of the necessary legislation, Ontario will also possess a strip of territory five miles wide lying between the district of Patricia and the Nelson River and to be located within 50 miles of the Hudson Bay Coast, as well as an area half a mile wide and five miles in length to be located along the south shore of the Nelson River. The latter area is to be contiguous to the five mile strip, and together these areas will afford ten miles of water front for harbour facilities and railway terminals. The land is to be selected and designated by the Ontario Government within five years from the date of the Order-in-Council.

Population of Canada.

According to the corrected returns of the fifth census, the total population on June 1, 1911, was 7,206,643, representing an increase of 1,835,328 since the previous census of April 1, 1901. For the period covered, the rate of increase, viz., 34.17 per cent., is the largest in the world, and is due to the heavy tide of immigration which set in with the beginning of the present century. The countries next in order, in respect to the percentage rates of increase during the same decade are: New Zealand, 30.5; the United States, 21; Germany, 15.2; Holland, 14.8; Switzerland, 13.2; Denmark, 12.6; Belgium, 10.9; Austria, 9.3; United Kingdom, 9.1; Hungary, 8.5; Sweden, 7.5; Italy and Norway, 6.8; and France, 1.6. Ontario and Quebec continue to be the most largely populated of the nine provinces, the former having 2,523,274 and the latter 2,003,232 inhabitants. None of the other provinces has yet reached half a million; but Saskatchewan has the third largest population with 492,432. All the provinces show an increase since 1901, excepting Prince Edward Island, where the population has decreased by 9,531, or 9.23 per cent. The Yukon and Northwest Territories, with relatively sparse populations, show decreases as compared with 1901. The greatest relative increase is in the western provinces, especially in Saskatchewan and Alberta. The population of Saskatchewan, 492,432, as compared with 91,279 in 1901, shows an increase of 401,153, or over 439 per cent. Alberta has grown from 73,022 in 1901 to 374,663 in 1911, an increase of 301,641, or 413 per cent. Manitoba, 455,614, shows an increase of 200,403 from 255,211, or 78.5 per cent., and British Columbia, one of 213,823, or over 119 per cent., the population having grown from 178,657 in 1901 to 392,480 in 1911.

The average density of the population works out to 1.93 per square mile, calculated upon the total of 3,729,665 square miles, as shown in Table 1. This figure may be compared with the density per square mile of other new countries, as, for instance, the United States, 30.69; the Argentine Republic, 5.99; the Commonwealth of Australia, 1.53; the Dominion of New Zealand, 9.63; and Newfoundland, 1.47. Prince Edward Island has a density of 42.91, Nova Scotia of 22.98, New Brunswick of 2.61, Ontario of 9.67, Manitoba of 6.18, and Quebec of 5.69. The other three provinces, Saskatchewan, Alberta and British Columbia are each below 2 per square mile.

Extension of Boundaries.

The boundaries of the provinces of Manitoba, Ontario and Quebec were extended by chapters 32 (Manitoba), 40 (Ontario), and 45 (Quebec). Particulars of the extensions thus effected are given in the Canadian Year Book of 1913. The Manitoba Act (chapter 32) contains new financial provisions (sections 4 and 5), governing the annual payments to be made by the Government of Canada to the Government of Manitoba in respect of interest,

public lands, swamp lands, public buildings, etc. The Quebec Act (chapter 45) provides by section 2 (a) and (b) that the population of the territory added by the Act shall be excluded in ascertaining the population of the province for the purposes of any readjustment of representation of the other provinces consequent upon any census, that in any future census the population of the new territory shall be distinguished from the province as heretofore constituted and that the representation of the new territory in the House of Commons shall be determined according to the rules enacted by section 51 of the British North America Act, 1867, regulating the representation of provinces other than Quebec. All three Acts came into force on May 15, 1912, by proclamations of the Governor-in-Council, dated May 10, 1912.

Aid to Agriculture.

Chapter 3 provides for the granting of subsidies to the provincial governments for the encouragement of agriculture, and empowers the Minister of Agriculture, with the authority of the Governor-in-Council, to enter into agreements with the provincial governments setting forth the terms upon which the subsidies are granted and prescribing the conditions under which and the purposes for which they shall be expended. For the financial year ended March 31, 1913, a total sum of \$500,000 was appropriated for the purposes of this Act (see also page 453).

The Agricultural Instruction Act, assented to on June 6, 1913, repeals chapter 3 of the Statutes of 1912 and provides for the appropriation of a sum of \$10,000,000 during the next ten years for the purpose of aiding and advancing the farming industry by instruction in agriculture, including the work carried on by the Veterinary Colleges. The sum available under this Act for the fiscal year ending March 31, 1914, is \$700,000; for 1915, \$800,000; for 1916, \$900,000; for 1917, \$1,000,000, and for 1918 to 1923, \$1,100,000 annually.

DOMINION CABINET.

Seat of Government—Ottawa.

Governor-General—Field Marshal His Royal Highness The Duke of Connaught and Strathearn, K.G., K.T., K.P., G.M.B., G.C.S.I., G.C.M.G., G.C.V.O., P.C.

The Cabinet.

Ministry formed 10th October, 1911.

Premier and President of Privy Council—Hon. Robert Laird Borden, LL.D., K.C.

Minister of Trade and Commerce—Hon. Geo. E. Foster, B.A., D.C.L., LL.D.

Minister of the Interior—Hon. Dr. Wm. Jas. Roche, M.D.

Minister of Public Works—Hon. Robert Rogers.

Minister of Railways and Canals—Hon. Frank Cochrane.

Minister of Finance—Hon. Wm. Thomas White.

Postmaster-General—Hon. Louis P. Pelletier, K.C.

Minister of Marine and Fisheries and Minister of the Naval Service—

Hon. John D. Hazen, B.A., B.C.L.

Minister of Justice—Hon. Chas. J. Doherty, K.C., D.C.L., LL.D.

Minister of Militia and Defense—Hon. Samuel Hughes.

Secretary of State—Hon. Louis Coderre.

Minister of Labor—Hon. Thomas W. Crothers, B.A., K.C.

Minister of Inland Revenue and Mines—Hon. Wilfred Nantel, K.C.

Minister of Customs—Hon. John D. Reed, M.D.

Minister of Agriculture—Hon. Martin Burrell.

Solicitor General—Hon. A. Meighen.

AGRICULTURAL DEPARTMENT.

Dominion.

Unless otherwise stated, the post-office address of the officials mentioned is Ottawa, Ontario.

Minister of Agriculture—Hon. Martin Burrell.

Deputy Minister of Agriculture—Geo. F. O'Halloran, B.A., B.C.L.
 Assistant Deputy Minister of Agriculture—Lt.-Col. A. L. Jarvis, I.S.O.
 Chief Officer Census and Statistics Branch—A. Blue, LL.D.
 Director-General Public Health—F. Montizambert, I.S.O., M.D., F.R.S.C.
 Veterinary Director-General—Dr. T. Torrance.
 Live Stock Commissioner—John Bright.
 Dairy Commissioner—J. A. Ruddick.
 Seed Commissioner—George H. Clark.
 Chief Veterinary Inspector—G. Hilton, V.S.
 Pathologist—C. H. Higgins, D.V.S., B.Sc.
 Hon'y. Veterinary Adviser—Prof. D. McEachran, F.R.C.V.S., Montreal.
 Veterinary Inspector-in-charge Manitoba—D. C. McGilvray, M.D.C.,
 Winnipeg.

Veterinary Inspector-in-charge Saskatchewan—D. Tamblyn, V.S.
 Veterinary Inspector-in-charge Alberta—J. C. Hargrave, V.S., Medicine
 Hat.

Veterinary Inspector-in-charge and Representative Live Stock Branch
 British Columbia—S. F. Tolmie, V.S., Victoria.

Chief Meat Inspector—R. Barnes, V.S.

The Canadian area of the five Great Lakes of 100,000 miles, forms only
 one-fifth of the total area of the larger fresh water lakes of Canada.

Distance from Halifax to Vancouver is greater than from London to
 Halifax.

Provincial Governments.

Each province has a Lieutenant-Governor appointed for five years by the
 Governor-General of Canada, and is aided by an executive council whose
 members have seats in the legislature and are responsible to the popular
 house for their actions in council. The provinces of Quebec and Nova Scotia
 have a legislative council composed of 21 and 24 members respectively,
 appointed by the lieutenant-governor in council of each province. In the
 other provinces there is only one house, an elected assembly. The duration
 of parliament is four years in all provinces excepting Nova Scotia and Quebec,
 where it is five years, although it may be dissolved at any time within that
 period. Sessions are held annually, the speaker is elected by the House,
 members are paid for their services and require no property qualifications.
 The powers of the legislatures are so defined in the British North America
 Act of 1867.

Province of Ontario.

Population, 2,523,297.

Entered Confederation 1st July, 1867.

Seat of Government, Toronto.

Lieutenant-Governor, His Honor Sir John Morrison Gibson, K.C., LL.D.

Executive Council.

President of Council and Premier—Hon. Sir J. P. Whitney.

Attorney-General—Hon. J. J. Foy.

Treasurer of the Province—Hon. I. B. Lucas.

Secretary and Registrar of Province—Hon. W. J. Hanna.

Minister of Education—Hon. R. A. Pyne.

Minister of Agriculture—Hon. J. S. Duff.

Minister of Public Works—Hon. J. O. Reaume.

Minister of Lands and Mines—Hon. Wm. H. Hearst.

Without Portfolio—Hon. J. S. Hendrie, C.V.O., Hon. A. Beck, Dr. Preston

Department of Agriculture.

Minister—Hon. J. S. Duff.

Deputy Minister—W. B. Roadhouse.

Assistant Deputy—C. F. Bailey.

Chief Clerk and Statistician—W. O. Galloway.

Supt. of Farmers' Institutes and Dairying—G. A. Putnam.

Supt. of Agricultural Societies—J. Lockie Wilson.

Director of Live Stock Branch—R. Wade, B.S.A.

Director of Fruit Branch and Secretary Fruit Growers' Association—
P. W. Hodgetts.

Ontario Veterinary College—Principal E. A. Grange, V.S., M.S.

Eastern Dairymen's Association—G. G. Publow, Kingston, Instr.

Western Dairymen's Association—F. Herns, London, Instr.

Province of Quebec.

Population, 2,002,726.

Entered Confederation 1st July, 1867.

Seat of Government, Quebec.

Lieutenant-Governor—His Hon. Sir Francis Langelier, Knt.

Executive Council.

Hon. Sir Lomer Gouin—Premier and Attorney-General.

Hon. Jules Allard—Minister of Lands and Forests.

Hon. John C. Kaine—Minister without Portfolio.

Hon. Charles Devlin—Minister of Colonization, Mines and Fisheries.

Hon. L. A. Taschereau—Minister of Public Works and Labor.

Hon. J. L. Decarie—Provincial Secretary.

Hon. J. E. Caron—Minister of Agriculture.

Hon. P. S. G. MacKenzie—Provincial Treasurer.

Hon. J. E. Tessier—Minister of Roads.

Hon. N. Perodeau—Minister without Portfolio.

Department of Agriculture.

Minister—Hon. Jos. Ed. Caron.

Deputy Minister—G. A. Gigault.

Secretary of Council of Agriculture—Oscar Lessard.

Provincial Secretary of Rural Roads—J. A. Camirand.

Province of New Brunswick

Population, 351,899.

Entered Confederation July 1st, 1867.

Seat of Government, Fredericton.

Lieutenant-Governor—J. Wood, D. C. L., LL.D.

Executive Council.

Premier and Surveyor-General—Hon. J. K. Flemming.

Provincial Secretary and Receiver-General—Hon. D. V. Landry.

Chief Commissioner of Public Works—Hon. John Morrissy.

Attorney-General—Hon. W. C. Hazen Grimmer, K.C.

Commissioner of Agriculture—Hon. J. A. Murray.

Solicitor-General—Hon. Harry F. McLeod.

President of the Council, without Portfolio—Hon. Robert Maxwell.

Department of Agriculture.

Commissioner—Hon. J. A. Landry.

Deputy Commissioner—J. E. Daggett.

Provincial Horticulturist—A. G. Turney.

Dairy Superintendent—C. W. McDougall.

Dairy Superintendent—L. C. Daigle.

Clerk and Supt. of Women's Institutes—Mrs. A. E. Dunbrack.

Province of Manitoba.

Population, 455,869.

Entered Confederation July 15th, 1870.

Seat of Government—Winnipeg.

Lieutenant-Governor—Sir Douglas Colin Cameron.

Provincial Executive.

Premier and Prov. Secretary—Sir Rodmond Roblin.

Minister of Agriculture, Immigration Comm., and Comm. of Public
Lands—Hon. George Lawrence.

Provincial Treasurer—Hon. H. Armstrong.

Minister of Public Works—Hon. Colin Campbell.

Chief Game Guardian—C. Barber.

Deputy Minister of Agriculture—S. A. Bedford.

Province of British Columbia.

Population, 390,229.

Entered Confederation July 20th, 1871.

Seat of Government, Victoria, V.I.

Lieutenant-Governor, His Hon. Thomas W. Paterson, Esq.

Executive Council.

Premier and Minister of Mines—Hon. Richard McBride.

Provincial Secretary and Minister of Education—Hon. H. E. Young,
M.D., LL.D.

Minister of Finance and Agriculture—Hon. Price Ellison.

Chief Comm. of Lands—Hon. W. R. Ross.

Minister of Works—Hon. Thomas Taylor.

Secretary to Agriculture—W. J. Bonavia.

Live Stock Comm.—W. T. McDonald.

Province of Nova Scotia.

Population, 492,338.

Entered Confederation July 1st, 1867.

Seat of Government, Halifax.

Lieutenant-Governor, His Hon. James Drummond McGregor.

Executive Council.

Premier and Provincial Secretary—Hon. G. H. Murray.

Commissioner of Works and Mines—E. H. Armstrong.

Secretary for Agriculture—M. Cumming, Truro.

Supt. of Agriculture Societies—F. L. Fuller.

Province of Prince Edward Island.

Population, 93,722.

Entered Confederation July 1st, 1873.

Seat of Government, Charlottetown.

Lieutenant-Governor—His. Hon. Benjamin Rogers.

Executive Council.

President, Premier and Attorney-General—Hon. J. A. Matheson.

Prov. Secretary-Treasurer and Comm. of Agriculture—M. McKinnon.

Comm. of Public Works—Jas. A. McNeill.

Secretary for Agriculture—Theo. Ross.

Province of Saskatchewan.

Population, 492,344.

Was established on Sept. 1st, 1905.

Seat of Government, Regina.

Lieutenant-Governor—His Hon. Geo. Wm. Brown.

Executive Council.

Premier, Pres. of Council and Minister of Public Works—Hon. Walter
Scott.

Provincial Secretary and Minister of Agriculture—Hon. W. R. Mother-
well.

Deputy Minister of Agriculture—A. F. Mantle.

Live Stock Comm.—L. C. Smith.

Dairy Supt.—W. C. Wilson.

Province of Alberta.

Population, 375,434.

Was established on Sept. 1st, 1905.

Seat of Government, Edmonton.

Lieutenant-Governor—His Hon. Geo. Hedley Vicars Bulyea.

Executive Council.

Premier, Minister of Public Works and Prov. Treasurer—Hon. A. L.
Sifton.

Attorney-General and Minister of Education—Hon. C. R. Mitchell.

Minister of Agriculture—Hon. Duncan Marshall.

Provincial Secretary—Hon. A. J. MacLean.

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Secretary of Industries and Immigration, Halifax, Nova Scotia.

Deputy Minister of Agriculture—Geo. Harcourt.
Live Stock Comm.—W. F. Stevens.
Dairy Comm.—C. Marker.

Yukon Territory.

Population, 8,512.
Organized June 13th, 1898.
Seat of Government, Dawson City.
Commissioner—A. Henderson, K.C.
Territorial Officials.
Treasurer and Supt. Public Works—D. R. MacFarlane.
Assayer Mines Department—R. Smart.
Supt. Education Department—T. G. Bragg.

Northwest Territories.

Population, 15,762.
Organized Sept. 1st, 1905.
Seat of Government, Ottawa.
Comprising all British territories and possessions in North America and all islands adjacent thereto, not included within any Province, or the Yukon Territory and the colony of Newfoundland and its dependencies.
Commissioner—Lt.-Col. F. White, C.M.G., Ottawa.

PUBLIC STATUTORY HOLIDAYS OF CANADA.

Dominion of Canada.

Sundays, New Year's Day, The Epiphany, Good Friday, The Ascension, All Saints' Day, Conception Day, Easter Monday, Ash Wednesday, Christmas Day, the birthday (June 3rd, or day fixed by proclamation for celebration of birthday) of reigning Sovereign, Victoria Day, Dominion Day, the first Monday of September (to be designated "Labor Day"), and any day appointed by proclamation for a general fast, or Thanksgiving Day.

Ontario.

Sundays, New Year's Day, Good Friday, Easter Monday, Christmas Day, Dominion Day, birthday of her late Majesty and her Royal successors, Labor Day, and any day appointed by proclamation of Governor-General or Lieutenant-Governor as a public holiday or for a general fast or thanksgiving, and any Dominion holiday not included in this list.

Quebec.

Sundays, New Year's Day, the festival of the Epiphany, Ash Wednesday, Good Friday, Easter Monday, The Ascension, All Saints' Day, Conception, Christmas Day, the anniversary of the birthday of the Sovereign (or the day fixed by proclamation for its celebration), 1st July (the anniversary of the day on which the Union Act came into force) or 2nd July (if 1st is a Sunday), any other day fixed by Royal proclamation or by proclamation of Governor-General or of the Lieutenant-Governor as a public holiday, or as a day of general fast or thanksgiving, or as Labor Day.

Nova Scotia.

Sundays, Good Friday, Dominion Day, Christmas Day, day appointed for celebration of the birthday of her late Majesty or any of her Royal successors, Labor Day, and any day appointed by proclamation of the Governor-General or Lieutenant-Governor as a general holiday, or for general fast or thanksgiving, and any Dominion holiday not included in this list.

New Brunswick.

Sundays, New Year's Day, Good Friday, Christmas Day, Dominion Day, Victoria Day, the day appointed for the celebration of the birthday of His Majesty, Labor Day, and any day appointed by proclamation of the Governor-General or Lieutenant-Governor as a public holiday, or for a general fast or thanksgiving within the Province, or which by any Act of the New Bruns-

wick Legislature, or of the Parliament of Canada is, or shall be, declared to be a public holiday within the Province.

Manitoba.

Sundays, New Year's Day, Good Friday, Christmas Day, Dominion Day, Labor Day, Victoria Day, the birthday of the reigning Sovereign, or the day set apart by proclamation of the Governor-General for the celebration thereof, and the day following such birthday, or following New Year's Day or Christmas Day when such day is Sunday, and any day appointed by proclamation for a general thanksgiving or general holiday, or as Arbor Day, and any Dominion holiday not included in this list.

British Columbia.

Sundays, New Year's Day, Good Friday, Easter Monday, Dominion Day, Christmas Day, the day appointed for the celebration of the birthday of her late Majesty and of her Royal successors, and any day appointed by proclamation for a general fast or thanksgiving, and any day appointed by proclamation or order of the Lieutenant-Governor-in-Council as a holiday, and any Dominion holiday not included in this list.

Prince Edward Island.

Sundays, Christmas Day, Good Friday, and any day appointed by proclamation for a general thanksgiving or fast, and any Dominion holiday not included in this list.

Alberta.

Sundays, New Year's Day, Ash Wednesday, Good Friday, Easter Monday, 2nd Friday in May (known as Arbor Day), Christmas Day, birthday of the reigning Sovereign, Dominion Day, Labor Day, and such day as may in each year be proclaimed a public holiday for the planting of forest and other trees, and any other day appointed by proclamation for a general fast or thanksgiving, and any Dominion holiday not included in this list.

Saskatchewan.

Same as Alberta.

Yukon Territory.

Same as Alberta and Saskatchewan.

Land and Water Area of Canada by Provinces and Territories.

Provinces	Land Sq. Miles	Water Sq. Miles	Total Land and Water Sq. Miles
P. E. Island	2,184	.....	2,184
Nova Scotia	21,068	360	21,428
New Brunswick	27,911	74	27,985
Quebec	690,865	15,969	706,834
Ontario	365,880	41,382	407,262
Manitoba	231,926	19,906	251,832
Saskatchewan	243,382	8,318	251,700
Alberta	252,925	2,360	255,285
British Columbia	353,416	2,439	355,855
Yukon	206,427	649	207,076
N. W. Territories	1,207,926	34,298	1,242,224
	3,603,910	125,755	3,729,665

Immigration to Canada from April to December Inclusive of the Current Fiscal Year.

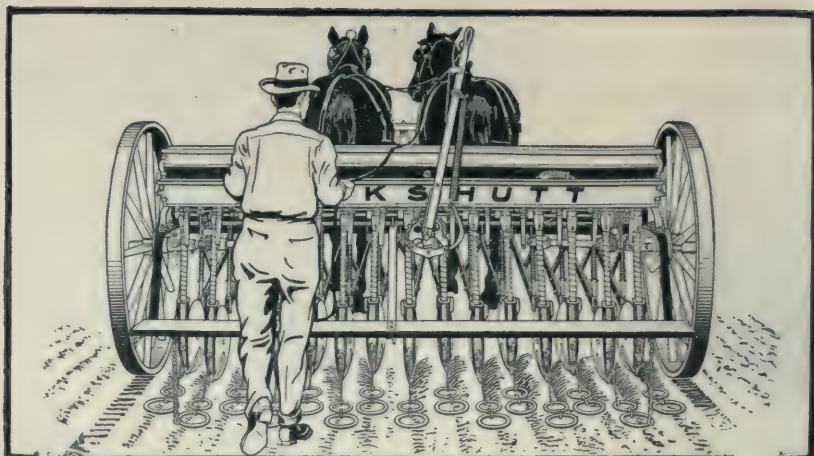
April	5,566	19,260	28,459	73,28	16%
May	31,374	14,247	27,517	73,138	10%
June	27,370	11,491	24,922	63,783	39%
July	14,804	9,042	16,854	40,700	19%
August	12,975	9,681	9,195	31,851	3% dec.
September	9,115	9,159	6,236	24,510	21% "
October	7,664	7,450	5,532	20,646	24% "
November	3,593	5,942	3,451	12,986	36% "
Total	134,461	86,272	122,166	340,899	6% Inc.

Population of Canada in 1901 and 1911 by Provinces and Territories and Estimated Population in 1913.

Provinces	1901	1911	(Est.) 1913
Alberta	73,022	374,663	436,916
British Columbia	178,657	392,480	432,543
Manitoba	255,211	455,614	496,000
New Brunswick	331,120	351,889	356,042
Nova Scotia	459,574	492,338	498,890
Ontario	2,182,947	2,523,274	2,591,367
Prince Edward Island	103,259	93,728	.....
Quebec	1,648,898	2,003,232	2,073,491
Saskatchewan	91,279	492,432	572,547
Yukon	27,219	8,512	.....
Northwest Territories	20,129	18,481	.....
Totals for Canada	5,371,315	7,206,643	7,477,796

Rural and Urban Population of Canada

Provinces	Population 1911		Increase since 1901	
	Rural	Urban	Rural	Urban
Alberta	232,726	141,937	180,327	121,314
British Columbia ..	188,796	203,684	100,318	113,505
Manitoba	255,249	200,365	70,511	129,892
New Brunswick ...	252,342	99,547	1,493	22,262
Nova Scotia	306,210	186,128	23,981	56,745
Ontario	1,194,785	1,328,489	52,184	392,551
P. E. Island	78,758	14,970	9,546	15
Quebec	1,032,618	970,614	39,951	314,383
Saskatchewan	361,067	131,365	287,338	113,815
Yukon	4,647	3,865	13,430	5,277
N. W. Territories ..	18,481	.....	1,285	.....
Totals for Canada	3,925,679	3,280,964	576,153	1,259,165



Insure Big Crops By Seeding With A COCKSHUTT DRILL

This season, plant with a COCKSHUTT DRILL. Get the biggest crop your acres can yield. The COCKSHUTT makes every seed count.

Its discs are a full inch closer together than those of most other drills. This means more rows per acre and more bushels yield. Three to five extra bushels per acre is the average increase with a COCKSHUTT DRILL.

The right amount of seed—in the right place—at the right depth—is the way the COCKSHUTT DRILL sows.

Pays for Itself

Three to five extra bushels per acre often pays for a COCKSHUTT DRILL the very first season. Why not get this extra crop out of your farm? Hundreds of other farmers are using COCKSHUTT DRILLS and more than saving the cost through increased crops the first year or so.

If you can see this drill at your nearest dealer's—so much the better. If he has none on hand, let us send you our complete illustrated Drill Book. Write and ask us to mail you a copy free.

COCKSHUTT PLOW COMPANY, LIMITED
BRANTFORD - ONTARIO

*Sold in Eastern Ontario, Quebec and Maritime
Provinces by*

THE FROST & WOOD COMPANY, LIMITED
Smith's Falls, Ont. Montreal, Que. St. John. N.B.

SOILS, CROPS AND FERTILIZERS

The twelve primary constituents found in plants and thus needed in the soil are:—

Nitrogen,	Iron Oxides,
Potash,	Magnesia,
Phosphoric Acid,	Sulphuric Acid,
Lime,	Silica,
Water (Hydrogen and Oxygen),	Soda,
Carbon,	Chlorine.

Nitrogen, phosphoric acid, potash and lime are the constituents generally lacking in soils when they fail to respond to the needs of crops. Either one of these four is likely to be deficient.

Classification of Soils.

Sandy, under 10% of clay.

Sandy Loam, 10% to 20% of clay.

Loam, 20% to 30% of clay.

Clay Loam, 30% to 50% of clay.

Strong clay, over 50%.

Marly, 5% to 50% calc carbonate.

Humus, over 5% vegetable matter.

The permanent fertility of a soil is nearly connected with its power of retaining plant food. In clay soils only traces of phosphoric acid are found in the drainage water.

Sandy soils being more open and thus freer drained are of less natural fertility and more dependent on immediate supplies of manure.

Humus or decayed vegetable matter, i.e., ploughed in clover, etc., greatly increases a soil's capacity for holding water.

Water Capacity.

Crops will not grow in soils permanently saturated with water and from which air is excluded. Best growth obtained in soils one-half or two-thirds saturated. The quantity of water a soil will hold when fully drained de-

termines its capacity for supplying a crop with water.

The finer the particles of the soil, or the more porous, the greater the amount of water held. When drained, coarse sand and coarse gravel soils hold the least water.

Loss of nitrogen is far less when a soil is under crop than in the case of a bare fallow.

Depth of Plowing.

Deep plowing of heavy land allows rain to penetrate it, establishes drainage in the surface soil and increases its temperature. Shallow surface cultivation preserves the soil water in time of drought. Rolling increases the moisture at the surface and the depth to which the soil is warmed by the sun.

A crop can only use up a certain amount of ready available plant food. Therefore, the waste as the soils become richer is greater, and this point should be borne in mind. To farm highly with profits demands more scientific knowledge and more practical skill than when a lower standard is aimed at. The last ton of roots in a big crop and the last few pounds of weight on a very fat animal cost the most to produce.

Nature of Soils.

Soils are made up of either very fine or very coarse particles and are classified accordingly.

Soils may differ in degree of firmness with which particles are held together.

Sand is composed of simple separate grains of large size.

Clay is composed of extremely fine granules.

A soil is in good tilth when its granules are neither too fine nor too coarse and when not too firmly cemented together.

Objects of Tillage.

To destroy and prevent growth of weeds.

To place under surface, manure stubble and other organic matter to be converted into food for plants.

To develop various degrees of openness of texture and uniformity of soil conditions suitable to planting.

To modify movement of soil moisture and soil air.

To regulate the temperature of the soil.

Tips on Tillage.

If you will open a book, place the fingers upon the fly leaf in front and the thumbs under the fly leaf in the back, and abruptly bend up the corner, it will be seen that every leaf is slipped over its neighbor. What takes place is represented in the accompanying illustration. Had pins been put through the book before attempting to bend the leaves, the bending would have tended to cut the pins into as many pieces as there were leaves as in figure.

The plow has exactly this effect upon the furrow slice; it tends to divide it into thin layers which slide over one another just as the leaves

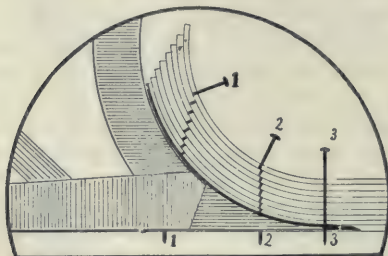


FIG. 76.—Showing the principle of the pulverizing action of the plow.

of the book did, and it is because of this kind of action that a plow pulverizes a soil as no other tool can.

How Plows Correct Tilth.

If a soil is out of tilth, has become cloddy, or partly puddled, there is a shape of mould-board, a stage of soil moisture and a depth of furrow slice which will help to restore tilth the best and quickest.

Work of Plow.

The deep furrow pulverizes better and puddles worse than the thin slice

or shallow furrow. A low mould-board plow disturbs tilth the least and leaves the texture the coarsest. The steep mould-board gives the greatest danger of puddling if the soil is too wet, and the greatest opportunity to pulverize the soil and improve the tilth if the moisture is right.

Forms of Plows, Etc.

To cut a clean furrow, slice and turn it over so as to completely cover whatever is on the surface, a long, low mould-board plow is used. (See fig. A.)

Type of Sod Plow Which Pulverizes Little.

If the primary objects are to thoroughly pulverize the soil, making it deep and mellow, a plow like Fig. B must be used. Shapes of plow intermediate between these two can be used according to the need.

Type of Plow With Steep Mould-board.

A heavy and soggy soil calls for a good slope of mould-board. A soil which is rather dry needs a fairly steep mould-board. A soil too open and porous like the sandy soils, should be plowed with a steep mould-board. If plowing must be done when soil is a little too wet, use the less steep mould-board and plow as shallow as other conditions will allow.

If soil has become too dry, use the steeper mould-board and plow deep, as this will split it into thinner layers, make the soil finer and the tilth better.

The Line of Draft.

It is important that the line of draft be right and that such a line connecting the centre of draft A (see illustration, page 81) in the mouldboard with the place of attachment to the plow bridle shall also be in the plane of the traces as shown by A, B, D. If the line of draft becomes broken, as A, C, D, or 1, 3, 5, instead of 1, 2, 5, the draft of the plow is made heavier.

Time of Plowing.

Early fall plowing in a dry season where the soil is light and the amount of levelling small is advisable. Plow as soon as crop is removed from ground, to save soil moisture and to enable the nitrates and other soluble salts to develop for next season.

Plowing Sod.

Skim plow in fall and cross plow in spring, or plow and disc to give de-



Fig. A. Low Mouldboard Plow
sired seed bed in spring. In this case

roll with heavy roller before discing.

Plowing Under Manure.

Coarse manure on light soil, plow deep furrow, as it needs more moisture to rot it, and in heavy soils will let air penetrate to greater depth. Plow in fall or very early spring.

If ground be dry and seeding time is at hand, thoroughly harrow and firm, using heavy roller to establish capillary action with deeper soil. When manure is well rotted it may be left nearer the surface except in sandy soils.

Table Showing Draft of Plows in Test in England and America

Kind of Soil.	No. of Plows.	Size of Furrow.	Draft per	
			Total Draft. lbs.	sq. in. of Furrow. lbs.
Loamy Sand	10	5 in. x 9 in.	227	5.04
Sandy Loam	10	5 in. x 9 in.	250	5.55
Pasture Soil	10	5 in. x 9 in.	280	6.22
Strong Loam	10	5 in. x 9 in.	440	9.72
Blue Clay	10	5 in. x 9 in.	661	14.69
Sandy Loam	5	6 in. x 9 in.	566	10.48
Stiff Clay Loam	14	7 in. x 10 in.	407	5.81

Relative Draft of Sod and Stubble Plows.

	Size of Furrow.	Total Draft.	Draft per sq. in.
Sod Plow with wheel coulter	5.5 in. x 15 in.	296.25 lbs.	3.524 lbs.
Sod Plow without coulter	5.3 in. x 14.5 in.	343.75 lbs.	4.453 lbs.

Difference 47.50 lbs. .929 lb.

	Size of Furrow.	Total Draft. lbs.	Draft per sq. in. lbs.
Stubble Plow without coulter	5.8 x 14.3 in.	452.4	5.3
Sod Plow without coulter	5.3 x 14.5 in.	343.75	4.4

Difference 108.6 .931

Soil Moisture and Draft.

	Sod Plow With Coulter. Draft per sq. in.	Sod Plow Without Coulter. Draft per sq. in.
Soil rather dry	8.616 lbs.	10.80 lbs.
Soil in best shape	3.524 lbs.	4.453 lbs.
Difference	5.092 lbs.	6.347 lbs.

CROPS TO SOILS.

The nature of the soil in a locality should determine the type of farming. Certain crops can be raised on a great variety of soils. The nature of crops which are most prolific on certain soils is as follows:—

Clay:	Hay	Peas
Timothy	Wheat	Sandy:
Apples	Oats	Timothy
Pears	Beets	Berries
Grapes	Cabbage	Peas
Hay	Turnips	Radishes
Wheat	Loam:	Lettuce
Oats	Timothy	and
Beets	Hay	other
Cabbage	Wheat	early
Turnips	Oats	vegetables.
Clay Loam:	Corn	Muck.
Timothy	Clover	Onions
Apples	Potatoes	Celery
Pears	Tomatoes	Cabbage
Grapes	Beets	

Cultivation—Frequent.

Cultivation makes the soil finer and deeper, allowing roots to go to a

greater depth and thus supplying more plant food.

Brings up the moisture in spring and enables the surface to drain dry enough (if natural or artificial drainage is good) to allow of an early seed bed.

Increases the water holding capacity of soils.

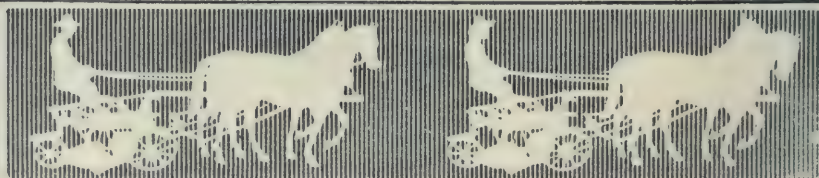
Conserves the summer moisture.

Makes soils sweeter and more airy.

Prevents growth of weeds which rob soil of moisture and plant food.

Twenty things affecting the value of farm property:—

Climate.	Appearance.
Shelter.	Depth of Productive Soil.
Lay of Land.	Texture of Soil.
Colon of Soil.	Fields.
Dampness of Soil.	Roads.
Fences.	Water Supply.
Pasture.	Buildings.
Drainage.	Locality.
Markets.	
Altitude.	



Massey-Harris Tillage Implements

Plows—Cultivators—Disc Harrows—Drag Harrows

A FULL line of Implements for preparing the seed bed—all of which have stood the test of time, and have come to be recognized as the standard of excellence—the most reliable and efficient Implements on the market to day.

Massey-Harris Co., Limited

Head Offices—TORONTO, CANADA

Branches at—Montreal, Moncton, Winnipeg, Regina, Saskatoon, Swift Current, Yorkton, Calgary, Edmonton

Agencies Everywhere

Fahrenheit Temp. of Germinations.

	Max.	Min.	Opt.
Wheat..	32.4°F	88 = 100°F	77.88°F
Oats ...	32.4°F	88 = 100°F	
Corn....	49 °F	115 °F	91 °F
Barley..	40 °F	100 = 110°F	77.88°F

Annual Pasture.

	Per acre.
Oats	51 lbs.
Early Amber Sugar Cane ...	30 "
Common Red Clover	7 "
	88 "

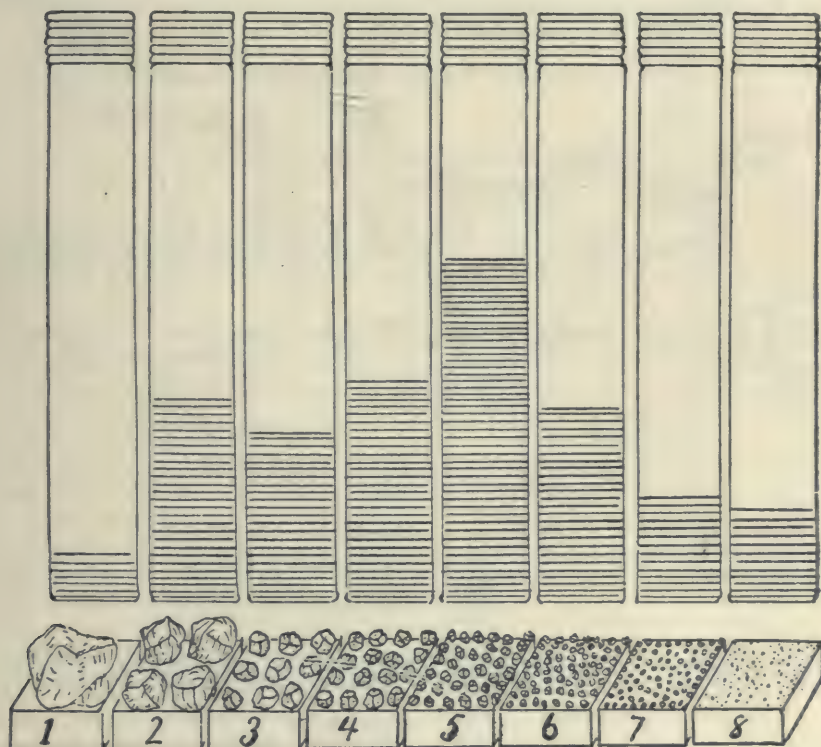
Timothy	3 "
	18 "

Permanent Pasture.

Two Year Pasture.

	Per acre.
Red Clover	6 lbs.
Alsike Clover	3 "
Meadow Fescue	3 "
Orchard Grass	3 "

	Per acre.
Orchard Grass	4 lbs.
Meadow Fescue	3 "
Tall Oat Grass	2 "
Meadow Foxtail	2 "
Timothy	2 "
Alsike Clover	2 "
White Clover	2 "
Alfalfa	5 "
	22 "



This illustration shows the relative size and shape of particles of a soil in good tilth. The lines above show the percentage of each.

Seed Selection.

Select your seed. Sow only large, plump, uninjured kernels. See that the color is good, the hull not too heavy and thick. Find out from observation what varieties do the best in your district. Put some blotting paper on a large plate; moisten with water, and on this place a number of the seeds you are intending to sow. Calculate the per cent. germination after it has sprouted. It should go at least 80%. Under that per cent. the seed is not profitable to use. Keep the plate in a fairly warm place and keep moist until seeds are germinated.

Table Showing Dry Substance.

Meadow Hay	85.7
Red Clover	84.0
Alfalfa Hay	84.0
Timothy	85.7
Corn (green)	17.1
Potatoes	25.0
Sugar Beet	25.0

carrots also get good use from it. Rape likes manure, but should be supplemented by artificial fertilizers.

Manure for clover seeding should be done in the fall when spring sowing is done. It will admirably follow heavily manured potatoe land. Corn needs from 20 to 23 tons for a maximum crop.

How to Find Beginning of Growing Season.

Forty-three degrees is the beginning of growth.

Take the average temperatures in your locality for the year. Then proceed to work out the following formula:

Suppose April 15 temp. is 41.7° This is too low, as the germination temperature is 43° . The temperature on May 15th is 53.5° . Now between these there must be a date where temperature is 43° . Proceed as follows:



FIG. 81.—Direction of the line of draft for plows.

Fodder Beet	12.0
Turnips	8.0
Wheat	85.7
Barley	85.7
Oats	85.7
Corn (kernels)	85.6
Corn (stover)	85.0
Gluten Meal	90.5
Wheat Bran	86.9
Cottonseed Cake	88.8
Linseed Cake	87.8

Crop Requirements.

Potatoes, sugar beets and corn get the most average good out of farm-yard manure. Turnips, swedes and

Temp. April 15th	41.7°
Temp. May 15th	53.5°

The difference in these 30 days is $53.5 - 41.7 = 11.8$.

Difference between 53.5° , the temp. of May and growing temp. of $43^{\circ} = 10.5$.

10.5 difference between May temp. and growing temp. multiplied by 30 (days) and divided by difference in 30 days which is $11.8 = 27$ days.

Formula =

Next temp. above date needed— 43×30 divided by

Next temp. above—next below.

Tons of Plant Food in Soils.

	Potash.	Lime.	Phosphoric	Sulphuric
	Tons.	Tons.	Acid. Tons.	Acid. Tons.
Sandy Soil	2.42	1.70	1.74	1.10
Clay Soil	6.38	12.3	2.82	1.50
Loam	8.70	16.0	4.0	1.8
Humus	6.39	37.8	1.5	1.4

Moisture Requirement of Common Crops.

	Water used per ton dry matter.	Depth of water used. Inches.	Dry matter per acre. Tons.	Acre inches of water in ton of dry matter.
Barley	464.1	20.69	5.05	4.096
Oats	503.9	39.53	8.89	4.447
Corn	270.9	15.76	6.59	2.391
Clover	576.6	22.34	4.39	5.089
Peas	477.2	16.89	4.009	4.212
Potatoes	385.1	23.78	6.995	3.399
Average	446.3	23.165	5.987	3.939

Approximate Amounts of Water Retained in Plowed and Unplowed Lands.

	1st foot lbs. water.	2nd foot lbs. water.	3rd foot lbs. water.	4th foot lbs. water.
Land plowed	13.87	20.66	18.32	16.05
Land not plowed	10.58	17.98	17.28	13.94
Loss on unplowed	3.29	2.68	1.04	2.11

Water Need of Crops versus Rainfall.

	Water added	Drained away	Total Depth of water used.	Water used compared with rain.
Wheat ..	12.09	0	22.6	2.15
Peas	14.88	0	27.38	2.19
Barley ..	10.61	0	18.52	2.24
Oats	13.24	0	21.15	2.57

Additional Manurial Requirements of Crops.

Grasses—Potash, lime and phosphoric acid.

Cereals—Nitrogen and phosphoric acid.

Clovers—Manures supplying potash and lime.

Legumes—Potash, phosphoric acid (barnyard manure).

Turnips—Phosphoric acid (also barnyard manure).

Mangels—Nitrogen (barnyard manure).

Potatoes—General manuring.

Water Required For One Acre of Crop.

	Average Amount	Minimum Amount
Clover	400	310
Potatoes	400	325

Wheat	350	300
Oats	375	300
Peas	375	300
Corn	300	
Grapes	375	
Sunflowers ...	2000	

Amount of barnyard manure required to replace the ingredients abstracted from the soil by an acre of each crop:

	Tons.		Tons.
Wheat	5	Potatoes	10
Barley	5	Cabbage	20
Oats	5	Carrots	10
Meadow Hay..	6	Turnips	15
Red Clover...	10	Swedes	12
Beans	10	Mangolds	20

Law of Minimum.

No matter how great the quantity of crop producing elements present that element in the smallest quantity decides the size of the crop.

Average Manure Production.

The average production of manure per animal per year is approximately as follows:

Horse	18.734 lbs.
Ox	39.672 "
Cow	22.244 "
Heifer	13.224 "
Hog	3.306 "
Sheep	1.102 to 2.204 "

Quantity of Manure Per Acre.

Medium well rotted as light dressing, 7 tons per acre; medium dressing, 10 tons per acre; heavy dressing, 14 tons per acre; very heavy, 17 tons per acre.

Old well rotted manure is richer than fresh manure, is more active in action and it must not be used in the same quantity as fresh manure. On heavy soil the manure furrow should not be very deep.



Fig. B. Steep Mouldboard Plow

On light soil the air penetrates deeply and thus the manure may be put deeper.

Composition of Barnyard Manure.

	Nitrogen	Phosp. Acid	Potash
Horse .	11.6 lbs	2.44 lbs.	8. 8 lbs.
Cattle .	6.8 "	1.39 "	6.64 "
Sheep .	16.6 "	2.00 "	11.12 "
Hog .	9.0 "	1.66 "	9. 6 "

Dimensions of Manure Pits.

Cattle.	Length.	Breadth.
10	32	19
20	32	32
30	59	32
40	65	39
50	82	39

Manure pits should be shallow; its bottom but $2\frac{1}{2}$ to $1\frac{1}{2}$ feet below ground.

Mulches of Soil.

The following table shows the relative effectiveness of soil mulches at different depths and different numbers of cultivation:—

	Not cultivated per acre.	Once in 2 weeks per acre.	Once per week per acre.	Twice per week per acre.
Cultivated 1 inch deep.				
Loss in tons per 100 days...	724.1	551.2	545.0	527.8
Loss in inches per 100 days..	6.394	4.867	4.812	4.662
The % water saved .....	.....	23.88	24.73	27.10
Cultivated 2 inches deep.				
Loss in tons per 100 days ..	724.1	609.2	552.1	515.4
Loss in inches per 100 days..	6.394	5.380	4.875	4.552
% water saved .....	.....	15.88	23.76	28.81
Cultivated 3 inches deep.				
Loss in tons per 100 days ..	724.1	612.0	531.5	495.0
Loss in inches per 100 days..	6.394	5.402	4.694	4.371
% water saved .....	.....	15.49	26.60	31.64

Raise A Crop Like This Yield of Corn

It does not matter what kind of crop you raise, it may be oats or mangels, apples or tobacco, you can achieve results similar to the one shown here if you follow our instructions. You can secure not only a larger yield per acre, but also a better quality crop and a more profitable crop if you use

DAVIES *SPECIAL MIXED* *FERTILIZERS*

There is a Davies fertilizer for every crop, and the guaranteed analysis, such as is recommended by the editor of this Year Book, is stamped on each and every bag.

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YOU can accomplish the same splendid results that other farmers have accomplished with Davies Fertilizers.

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Wm. Limited
West Toronto

We have an agent near you



Relative "Supply and Demand" of Seven Elements.

Essential Plant Food Elements	Pounds in two million of the average crust of the earth	Pounds in 100 bushels of corn (Grain only)	Number of years' supply indicated
Phosphorus.....	2,200	17	130
Potassium.....	49,200	19	2,600
Magnesium.....	48,000	7	7,000
Calcium.....	68,000	1 1-4	55,000
Iron.....	88,600	1-2	200,000
Sulphur.....	2,200	1-4	10,000
Nitrogen in air	70 million pound over one acre	100	700,000

Two million pounds are taken as corresponding to the weight of the soil of the plowed acre of average land to the depth of 6 2-3 inches. Consequently, the table simply gives the amount of plant food contained in an acre of land of plowed soil, if it represents the average composition of the solid crust of the earth. Corn has been used by Hopkins in his calculation because it is the most im-

portant crop in America. It is evident that there is probably no cultivated soil whose composition is exactly the same as the average of the earth's crust, yet the data given in the table serves to show the relative abundance of the elements, and, if some soils are richer, others are certainly poorer, and, further, that there is plant food for many crops, and, in the case of most of the elements, for many hundreds of crops.

Barnyard Manure.

One ton of manure will contain:

9 to 15 lbs. of Nitrogen.

9 to 15 lbs. of Potash.

4 to 9 lbs. of Phosphoric Acid.

Farmyard manure, in fermenting, should not rise above 30 degrees C. (86 degrees F.) in temperature; keep cool with liquid manure. Humic and ulmic acids are formed, which unite with and fix the ammonia and potash. Ferrous sulphate added forms ammoniac sulphate and ferrous carbonate—both plant foods. Gypsum prevents the waste of nitrogen; and kainit, if added, will fix the ammonia.

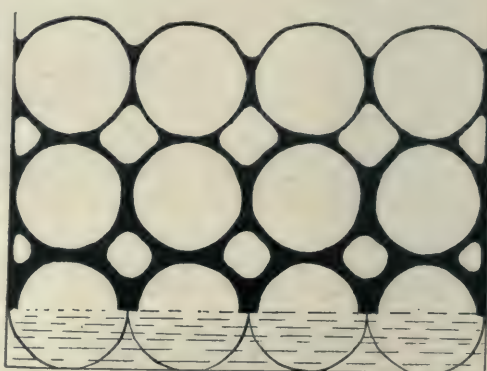
Green Manures.

Plow deep, using jointer and drag chain, if necessary, to bury well. Firm soil after plowing.

To Calculate Manure Production.

Fresh manure is made up of

$\frac{1}{4}$ dry matter and $\frac{3}{4}$ water and in order to calculate the manure a cow will make one-half the dry substance in the fodder must be multiplied by four.



This cut shows water holding capacity of a soil.

Plant Food—Constituents of Plants

I.		
Combustible Part.		
	Carbon	
	Hydrogen	
	Oxygen	
	Nitrogen	
	Sulphur	
II.		
Essential	Ash.	Active Constituents
	Phosphorus	
	Potassium	
	Calcium	
	Magnesium	
	Iron	
	Sodium	
	Silicon	
	Chlorine	
Not so Essential	Manganese	Partially Dormant Constituents
	Iodine	
	Fluorine	
	Lithium	
	Bromine	
	Caesium	
	Rubidium	
Possibly Essential to Some Plants	Copper	Wholly Dormant Constituents
	Lead	
	Arsenic	
	Zinc	
	Tellurium	
	Barium	

Balanced Supply.

A plant must have each and every one of the different plant foods. Each is essential to aid in some particular function, and no one can be substituted for another. Nature has supplied an abundance or most of the essential foods, but sometimes some of them are lacking or are in an unavailable condition. Of all the elements of plant foods which are essential, only a few are often in this condition. These are nitrogen, phosphoric acid, potash and lime. The term, plant food, as ordinarily used by farmers, includes nitrogen, phosphoric acid and potash only, not that these are any more essential to plant growth than are the other substances, but because of the deficiency of them

in many soils, and their corresponding commercial importance.

Nitrogen is an essential fertilizing element. It is the most expensive, and consequently, the most important commercially of the plant foods. It exists in that part of the soil composed of organic material. The nitrogen originally all came from the atmosphere. Four-fifths of the air is nitrogen. In the pure state it is a gas, but in the soil it is a constituent of the organic materials. Phosphoric acid does not exist in the soil in a free state. It unites with lime and forms phosphates or lime.

Lime and phosphoric acid unite in three different proportions: 1. One part phosphoric acid and one lime. 2. One part phosphoric acid and two



Illustrating the law of minimum.

lime. 3. One part phosphoric acid and three lime. These are called, respectively: 1, mono-calcic phosphate; 2, di-calcic phosphate, and 3, tri-calcic phosphate. It is in the form of these lime combinations that plants obtain their phosphoric acid. These three substances vary in the way in which they dissolve in water, and hence are not equally available as plant food.

Mono-calcic phosphate dissolves in water as does sugar or salt, and consequently, its phosphoric acid is directly available.

POTASH

For All Crops - On All Soils

To grow maximum crops an agriculturist must see that his soil contains an adequate supply of readily available POTASH for the plants' needs. A maximum crop means increased profits. POTASH increases quantity, improves quality and promotes maturity. POTASH is the dominant ingredient in a fertilizer for Potatoes, Tobacco, Legumes, and most Fruit and Vegetable crops. A glance at the following figures will show that Canadian Agriculturists are realizing the value of POTASH in the pursuit of their calling. The figures show the cash value of Potash Salts imported into Canada for agricultural purposes in the years 1906 and 1913:

	1906.	1913.
Manufactured Fertilizers - (containing Potash)	\$167,508	\$539,905
Muriate of Potash, Sulphate of Potash and Kainit	43,471	195,171
Total value of POTASH imported....	87,848	330,399

The German Potash Syndicate has a trained staff of agricultural experts who are at the disposal of any Canadian farmer who may require assistance in the solution of his soil problems.

CORRESPONDENCE on these matters is solicited.

Our educative bulletins on the important subject of fertilization are sent FREE to anyone interested on request. The following are some of the more important bulletins:

"Artificial Fertilizers; Their Nature and Use."

"The Potato Crop in Canada."

"Fertilizing Orchard and Garden."

"Fertilizing Hoed Crops."

"Fertilizing Grain and Grasses."

"Farmer's Companion," etc., etc.

German Potash Syndicate

1102-05-06 Temple Building, TORONTO

Three, Four and Five Year Crop Rotations

Systematic Rotation Recommended by the Dominion Experimental Farm, Ottawa, to Meet the General Conditions of Canadian Agriculture.

Wise selection and rotation of crops, prevent exhaustion of plant food, supplies nitrogen, cleans the lands of noxious weeds, promotes good physical condition of soil, conserves soil moisture and plant food, reduces loss in bad seasons, increases crop yield and crop quality.

Length of Rotation.	First Year.	Second Year.	Third Year.	Fourth Year.
Three Years' Duration.	Corn, roots, potatoes for corn, summer plow alsike, 7 lbs. alfalfa, 6 lbs. timothy, manure in either case.	Cereals seeded down to 6 lbs. red clover, 2 lbs. alsike, 6 corn, etc., the next year.	Hay or part hay and pasture followed by corn, etc., the next year.	
Four Years' Duration.	Corn roots, potatoes or peas. Land plowed for roots, peas, potatoes or peas early the preceding fall, corn land plowed in spring, corn, root and potatoe land, manured.	Grain mixture: Peas, 1 bushel; barley, 1 bushel; oats, 2 bushels, sown at the rate of 3 bushels per acre. Seeded down with red clover, 6 lbs.; alsike, 2 lbs.; alfalfa, 7 to 8 lbs.; timothy, 6 lbs.	Part pasture, part hay or hay cut early and pasture part of after-math. Cut hay twice off part of area.	Hay and pasture part intended for roots, potatoes or peas to be plowed early in August, rolled and disced and cultivated, corn area plowed next spring, manure applied as convenient during summer, winter and spring, preparatory to hoed crop.
Five Year Rotation.	Grain seeded down to clover.	Clover hay or pasture.	Corn, potatoes, and peas.	Grain followed by clover hay the following year.

CROPS RECOMMENDED FOR ONTARIO.

Experiments.	Varieties.	Com- para- tive Value	Yield per Acre		
			Straw (tons)	Grain (bus.)	Grain (lbs.)
Oats (87 tests).....	O. A. C. No. 72.....	100	1.25	39.81	1,354
	Siberian.....	88	1.33	38.73	1,317
	Regenerated Abundance....	95	1.13	38.20	1,299
	Lincoln.....	74	1.13	34.82	1,134
Six-rowed Barley (33 tests)..	Emmer.....	80	1.08	.....	1,331
	O. A. C. No. 21.....	100	1.06	27.67	1,329
Hulless Barley (9 tests)....	Guy Mayle.....	100	1.88	23.37	1,402
	Black Hulless.....	82	1.53	21.21	1,273
Spring Wheat (14 tests)....	Wild Goose.....	100	1.19	19.60	1,176
	Hungarian.....	79	1.07	16.73	1,004
Emmer and Spelt (3 tests)..	Common Emmer.....	100	.62	34.34	1,374
	Alstrom Spelt.....	53	.48	21.00	840
Buckwheat (2 tests).....	Rye.....	100	1.36	15.30	734
	Silver Hull.....	95	1.71	10.98	527
Winter Wheat (24 tests)....	American Banner.....	96	1.21	23.80	1,428
	Imperial Amber.....	100	1.20	23.34	1,400
	Tasmania Red.....	91	1.20	23.00	1,380
	No. 5 Red.....	65	1.20	20.73	1,244
	Crimean Red.....	57	.96	19.18	1,151
Winter Rye (2 tests).....	Mammoth White.....	100	2.91	24.83	1,390
	Common White.....	67	3.00	21.43	1,200
Spring Rye (7 tests).....	O. A. C. No. 61.....	100	1.04	17.91	1,003
	Common.....	67	1.06	16.33	914
Field Peas (27 tests).....	New Canadian Beauty....	100	1.35	17.89	1,074
	Early Britain.....	82	1.05	17.84	1,076
Field Beans (19 tests).....	Marrowfat.....	95	1.22	18.59	1,115
	New Prize Winner.....	92	1.07	18.25	1,095
	White Wonder.....	100	1.10	17.91	1,074
Corn for Grain (16 tests)...			Whole Crop		
	Early California Flint....	100	5.98	47.63	2,667
	Genesee Valley.....	58	6.18	42.90	2,402
	Wisconsin Little Dent....	82	4.91	41.94	2,349
Sorghum for Grain (3 tests)	Early Minnesota Sugar Cane.....	100	10.04	36.12	1,734
	Early Amber Sugar Cane	90	5.93	34.45	1,654

EARLY SEEDING.

When the crop is started to grow upon the land as early as the temperature of soil and air will permit, the farmer is conserving soil moisture by taking advantage of that which would otherwise be lost by soil evaporation, and enabling his crop to use this in growth. Such timely planting will also save plant food from being lost in the drainage water.

Root Crops, Etc., for General Conditions.

Experiments	Varieties	Comp. value	Tons per acre
Mangels (6 tests).....	Ideal (Ontario Seed Co.).....	83	25.34
	Yellow Leviathan.....	100	24.24
	Sutton's Mammoth Long Red.....	75	23.83
Sugar Beets (4 tests).....	Rennie's Tankard Cream.....	100	24.38
	Bruce's Giant White Feeding.....	91	23.01
Swede Turnips (2 tests)..	Carter's Invicta.....	100	17.26
	Bruce's New Century.....	92	16.50
	Rennie's Empress.....	88	15.96
Carrots (5 tests).....	Steele-Briggs Improved Short White....	100	13.79
	Simmer's Giant Short White.....	96	13.50
Fodder Corn (4 tests)...	Sterling White Dent.....	100	11.09
	Hoopengardner's Very Early Yellow Dent	94	10.90
	White Cap Yellow Dent.....	91	10.28
Grass, Peas and Vetches.. (4 tests).....	Hairy Vetches.....	100	7.18
	Common Vetches.....	79	5.80
	Grass Peas.....	100	5.56
Millet (4 tests).....	Japanese Barnyard.....	78	6.00
	Hungarian Grass.....	100	5.47
	Golden Wonder.....	100	5.00

Seed Selection in Nine Provinces.

	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Per cent using seed grain from own farm.....	90	53	81	87	87	93	100	79	37
Per cent systematically selecting seed.....		2	2	4	2	24	none	5	3
Per cent keeping best part of field for seed.....	23	40	69	88	56	55	91	62	34
Per cent cleaning seed grain with fanning mill.....	99	25	81	89	100	86	95	98	37
Per cent knowing names of varieties of grain sown.....	90	74	44	49	62	80	100	85	26
Per cent knowing part of names.....	8	19	23	23	24	1		14	13
Per cent not knowing names of varieties sown.....	2	7	33	28	14	19			36
Per cent saving their own timothy seed.....	73	31	45	44	41			21	2
Per cent saving their own clover seed.....	2	1	2	14	40				1
Acres seeded to clover this year.....	1,285	590	835	3,134	4,745				1,545
Per cent of grain seeded to clover.....	51	49	52	53	40				32
Average lbs. per acre sown to red clover.....	2.5	5	4	4	5			7	9
Average lbs. per acre of alsike.....	1	3	3	4	1				4
Average lbs. per acre of timothy.....	8	10	7	8	5	8		6	6

**Average Cost of Production, Value and Profit per acre of Wheat, Oats,
Barley, Flax and Corn in Ontario.**

Items.	Fall Wheat.	Spring Wheat.	Oats.	Barley.	Flax.	Corn for husking.
Preparation	\$ 4.32	\$ 3.28	\$ 3.28	\$ 3.27	\$ 3.32	\$4.49
Seed	1.79	1.85	1.16	1.42	1.93	.75
Seeding	1.16	....	....	....	....	.87
Cultivation .....	....	1.05	1.00	1.04	.98	2.93
Harvesting	1.76	1.72	1.58	1.58	2.75	3.05
Threshing	1.70	1.57	1.76	1.52	1.55	3.85
Wear and Tear of Im- plements .....	.39	.39	.54	.42	.54	.54
Rental Value	2.98	2.85	2.85	2.82	2.93	3.00
Total	14.10	12.71	12.17	12.07	14.00	19.48
Value of Produce	22.36	16.16	14.76	18.43	21.55	28.13
Profits	8.26	3.45	2.95	6.36	7.55	8.65

Total Amount of Mineral Matter and Fertilizers Removed from Soil

Crop	Weight of Crop Lbs.	Ash Lbs.	Nitrogen Lbs.	Potash Lbs.	Phos- phoric Acid Lbs.
Barley (grain).....	100	2.45	1-1.51	0.48	0.88
Carrots.....	100	1.02	.16	.51	.01
Clover hay, red....	100	6.93	2.07	2.20	.38
Clover hay, crimson	100	7.70	2.05	1.31	.40
Cow Pea.....	100	1.47	.27	.31	.10
Oats (grain).....	100	3	1-2	.50-.60	.82-.85
Potatoes.....	100	1	.21	.29	.07
Rye.....	100	1.90	1-2	.54	.82
Timothy Hay.....	100	4.93	1.26	.90	.53
Tobacco Leaf.....	100	11-22	1-2	2-6	4-.7
Wheat (grain).....	100	1.75	1.96-2.36	.61	.89
Sug. Beets, Roots..	1,000	5-11.4	1-4	2-3.3	.51-1.1
Sug. Beets, Leaves	1,000	18-34	2-3.8	2-10.0	.9 -2
Flax, grown on one acre, whole plant	4,124	136.46	74.24	43.77	40.59
Corn(kernels).....	100	1.50-1.53	1.60-.82	.40-.51	.53-.70
Corn, other parts necessary to pro- duce 100 lbs. (kernels)					
Stalks.....	413.3	5.17	1.16	1.69	.58
Husks.....	46.7	.26	.08	.10	.03
Cobs.....	106.6	.63	.22	.23	.05

Effect Upon the Soil of Growing Various Crops

The tables on pages 33 and 39 show: (1) The amount of the principal elements of fertility removed by the principal crops of this country; and (2) the amount of available plant food contained in the principal commercial fertilizers and barnyard manure. By use of these tables, the farmer can estimate with fair accuracy the condition in which his land is left after cultivating and removing any crop included in the list.

For example: Suppose a farmer takes from an acre of ground 30 bushels of barley. This would be 1,440 lbs. Accordingly, there would be removed 14.40×1.51 , or 21.744

lbs. of nitrogen; $14.40 \times .48$, or 6.912 lbs. of potash; and $14.40 \times .88$, or 12.672 lbs. phosphoric acid. If, then, a farmer knows nearly the condition of his land at the beginning of the season, and how much fertilizing material he has added in the shape of manure, he can judge whether it will be necessary to supply more of any or all of the elements for the next season, and what crop should come next in rotation. The loss from destructive fermentation of barnyard manures may be almost entirely prevented by the use of absorbents, and especially by keeping the manure moist, and excluding the air.

Artificial Fertilizers

Soluble manures, such as nitrate, guano, etc., should be applied to the land in spring; undissolved manures, such as phosphates, slag, etc., in autumn. Soluble manures, again, suit heavy land; while undissolved varieties, whole bone, and the like, give best results on light soils. Dung may be plowed in in autumn on heavy land, but kept over till Spring on the lighter lands; on grass should be applied as a top-dressing in autumn on all varieties of land. The soil has great retentive power for phosphates and potash, but nitrogenous material easily decomposes, and the resultant nitrates wash out. Little at a time and more frequent dressings is therefore a good rule to follow in all manures, but especially with the nitrogenous—nitrate of soda, for instance, giving better results if put twice on a crop.

Fertilizer Act.

The law of the Fertilizer Act is stated as follows: All material excepting farmyard manure must be sold according to guarantee. The form of guarantee is as follows:

1. Name of brand.
2. Registration number.
3. Name and address of manufacturer.
4. Analysis as guaranteed by the manufacturer which shall show the percentage protein, fat and fibre. percentage nitrogen, phosph. and potash.

Any purchaser may have an analysis made by the Department of Inland Revenue at a fee of \$1.00. Samples must be taken in conformity with the regulations. For information write the Deputy Minister of Inland Revenue, Ottawa.

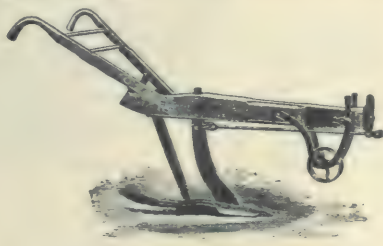
Determination of Fertilizer Needs.

A chemical analysis is of little value in determining just what element of growth your soil may be lacking in. A practical experiment is a sure method to find the need of a particular crop or a particular soil.

Mark out five $\frac{1}{8}$ acre plots and proceed as follows:

- Plot 1. No fertilizer.
- Plot 2. Complete fertilizer (phosphoric acid, potash, nitrogen).
- Plot 3. Phosphoric acid and nitrogen.
- Plot 4. Phosphoric acid and potash.
- Plot 5. Nitrogen and potash.

Then plant your crop under same conditions in each of these plots and watch results.



Type of Subsoil Plow.

Artificial Fertilizer Losses.

Where a farmer's system of management does not provide sufficient stable manure to meet the requirements of the soil, or there are fields where barnyard manure cannot be applied, the use of animal and chemical fertilizers is to be recommended. Such materials as dried blood, tankage and finely ground bone meal and potassium fertilizers will benefit a variety of soils and make valuable fields that would be otherwise useless. When bone meal is of a reliable character there is no cheaper source of nitrogen and phosphoric acid.

Indirect Fertilizers.

Indirect fertilizers are those which do not in themselves supply plant food, but whose chief value depends upon the ability they possess of changing the insoluble and unavailable potash and phosphoric acid into available forms.

Gypsum lime, common salt, are of this nature. These should be used in moderation. One to one-half tons per acre at intervals of five to six years would be a safe application of lime.

Direct Fertilizers.

There are those which contribute directly to the growth of plants. They may contain either nitrogen, phosphoric acid or potash, or all or any two of these.

Nitrogen fertilizers, nitrate of soda, sulphate of ammonia, dried

blood and calcium cyanamide, are the most important and pure.

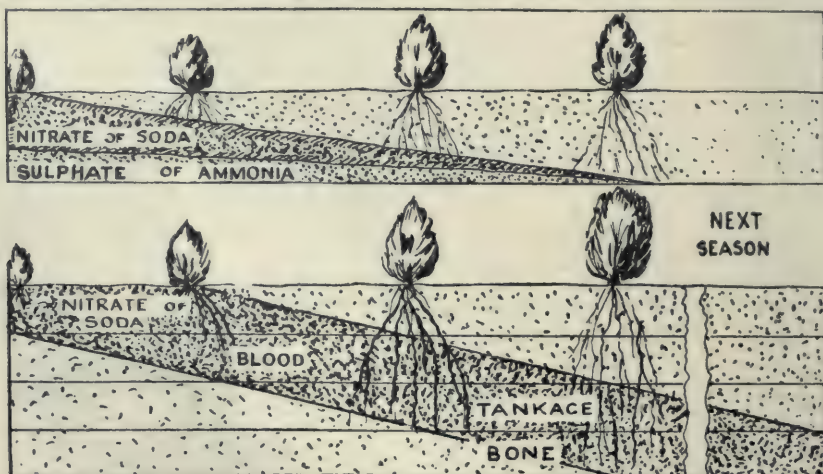
Potash, muriate of potash and sulphate of potash. Former contains 50% and latter 35% potash. Both are soluble and immediately available.

Phosphatic, ground rock and superphosphate are those most readily available.

Thomas phosphate, bone meal, bone ash, bone black, meat scrap, tankage, are materials containing more than one nutrient and their value, whilst not immediate, will spread over a fairly large period of time when made available by the action of the soil acids. Therefore it is reasonable to believe that an application of fertilizers, giving different sources of the same needed element, and thus becoming available at a different period of growth, will have a good and valuable effect on the growing crop.

To obtain this result, the fertilizers made up of the by-products of slaughter houses, etc., in Canada will produce favorable results. Purchased from reliable firms, animal fertilizers living up to the professed analysis have good value for the purchaser, and where their presence is needed are to be recommended.

Mineral fertilizers such as potash, nitrate of soda, acid phosphate, etc., are all beneficial and reliable.



This Illustrates the Value of Using Different Sources of Same Element Needed in Fertility, Thus Giving Plant Food Throughout Growing Season.

Quantities of Fertilizers for Various Crops

There are so many factors in determining the fertilizer requirements of the soil that it is quite impossible to prescribe accurately the exact quantities to be applied, without a knowledge of the soil's condition, previous treatment, etc. However, it is well to remember that any excess of potash or phosphoric acid will be retained in the soil for the use of the succeeding crop. The following prescriptions for some of the more important crops may be taken as approximating the requirements per acre under average conditions:

FOR CORN AND OATS AND SPRING SEEDING:—

- 200 pounds nitrate of soda.
- 200 pounds sulphate of ammonia.
- 400 pounds tankage (6-30).
- 1,000 pounds acid phosphate, 14 per cent.
- 200 pounds muriate of potash.

Guarantee: 4.5 per cent. nitrogen, 10 per cent. phosphoric acid, and 5 per cent. potash. To be applied at the rate of 600 to 800 pounds per acre, when used alone, and 300 to 400 in conjunction with manure. For corn, use about half in the hill, or drill, and the remainder broadcast.

FOR TOP-DRESSING GRASS:—

- 700 pounds nitrate of soda.
 - 1,000 pounds ground bone.
 - 300 pounds muriate of potash.
- Guarantee: 6.5 per cent. nitrogen, 11 per cent. phosphoric acid, and 7.5 per cent. potash. To be applied about May 1st, or just as the grass is beginning to show green, at the rate of 300 to 400 pounds per acre.
- For Early Fall Seeding of Grass:—
- 300 pounds of nitrate of soda.
 - 700 pounds ground bone.
 - 700 pounds basic slag.
 - 300 pounds muriate of potash.

Guarantee: 3.1 per cent. nitrogen, 10 per cent. phosphoric acid, and 7.5 per cent. potash. To be applied at the rate of 600 to 800 pounds per acre before seeding. For late fall seeding, save the nitrate of soda and about half the bone and muriate of

potash, and apply the following spring.

For Potatoes:—

- 300 pounds nitrate of soda.
- 700 pounds tankage (9-20).
- 600 pounds acid phosphate, 14 per cent.
- 400 pounds muriate or sulphate of potash.

Guarantee: Nitrogen 4.8 per cent., phosphoric acid 7.7 per cent., potash 10 per cent. To be applied broadcast at the rate of 1,200 to 2,000 pounds per acre, and harrowed in about 10 days after planting, or just before the potatoes come through the ground.

FOR APPLE TREES (1 to 7 years after planting):—

- 200 pounds nitrate of soda.
- 400 pounds tankage (9-20).
- 400 pounds basic slag.
- 200 pounds sulphate of potash.

Guarantee: 5 per cent. nitrogen, 8.3 per cent. phosphoric acid, 8.3 per cent. potash. To be applied in the spring, just as the leaves are expanding, at the rate of 1-4 lb. per square yard, gradually increasing the area covered around the tree from 1 square yard the first year to 30 to 50 square yards at the end of the seven-year period.

FOR APPLE TREES (of bearing age in cultivated orchards):—

Apply mixture of 10 lbs. of basic slag and 5 lbs. of sulphate of potash per tree at the time of the first spring cultivation. Between June 15th and July 1, apply 3 lbs. of nitrate of soda per tree broadcast under drip of branches.

FOR APPLE TREES:—

- In sod and neglected orchards, use the following mixture per tree:—
- 5 pounds nitrate of soda.
- 15 pounds tankage (9-20).
- 20 pounds basic slag.
- 10 pounds sulphate of potash.

The first year use the full amount; in succeeding years use one-half the amount. Apply broadcast in the spring, mostly toward the outer edge

GUNNS SHUR-GAIN

REGISTERED

Poultry and Stock Foods

---are the result of forty years of painstaking effort and research in the study and handling of farm produce.

Study your feeding problems with the greatest care. Each animal requires a different treatment and feeding is one of the most important operations on the farm.

Protein is the most expensive of food elements. When comparing the prices of feeds do not overlook the amount of protein each contains.

For these reasons the farmer who feeds Gunns Shur-Gain Foods, can be absolutely certain of results ---better stock better birds, more milk, or more eggs--- in other words, more profits.

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BEEF SCRAP
CHICK SCRAP
BEEF MEAL
POULTRYBONE
CALF MEAL
DAIRY MEAL
HOG MEAL
DIGESTIVE
TANKAGE
CHARCOAL

Write *Gunns Limited* West Toronto

of the circle of ground covered by the branches of the tree.

FOR CURRANTS, GOOSEBERRIES,

Raspberries and Blackberries use the following mixture per acre:—
 100 pounds nitrate of soda.
 200 pounds tankage (9-20).
 500 pounds basic slag.
 200 pounds sulphate of potash.

Apply broadcast with first cultivation in the spring.

FOR STRAWBERRIES:—

Use the formula given for currants, etc., increasing the quantity to 1,800 lbs. per acre, and making the application just before setting the plants. As the plants are coming into bloom, apply 150 lbs. of nitrate of soda.

The following formula may be used in vegetable growing:

100 pounds nitrate of soda.
 250 pounds tankage (9-20).
 500 pounds acid phosphate, 14 per cent.
 200 pounds muriate of potash.

To be applied before planting, at the above rate per acre, where only small amount of manure is available. When 12 to 20 tons of manure can be applied, the amount per acre may be reduced one-third to one-half. The formula in most cases must be supplemented with about 300 to 400 lbs. of nitrate of soda applied in three or four applications during the growing season.

CLOVER GRASS MIXTURES FOR ALTERNATE PASTURES


	Rich Clay and Loam Soil (Hay and Pasture)	Mild Loam and Sandy Loam (Hay and Pasture)	Loamy Sand and Sandy Soil (Hay and Pasture)	Humus Soil (Hay and Pasture)	Light Loam Sand (Sheep pas- ture only)	Better Class Sand Soil (Sheep and) Young Cattle
Red Clover.....	16.0 lbs.	10.7 lbs.	7.14 lbs.	3.57 lbs.	....	..
Alsike.....	4.46 "	5.35 "	1.78 "	8.92 "	....	....
White Clover.....	2.68 "	3.57 "	3.57 "	5.36 "	7.14 lbs.	7.14 lbs.
Trefoil.....	....	2.68 "	2.68 "	3.57 "	5.35 "	3.57 "
Kidney Vetch.....	....	....	1.78 "	....	3.57 "	2.68 "
Perennial Rye Grass..	8.03 "	8.92 "	8.92 "	....	8.92 "	8.92 "
Italian Rye Grass....	2.68 "	7.14 "	7.14 "	....	....	....
Timothy.....	2.68 "	2.68 "	2.68 "	3.57 "	3.57 "	3.57 "
Meadow Fescue.....	....	....	....	5.35 "	....	....
Sheep's Fescue.....	....	....	....	1.78 "	8.92 "	5.35 "
Orchard Grass.....	....	....	3.57 "	4.46 "	....	....
Rough-stalked Mead- ow Grass.....	....	....	....	2.68 "	....	....
Kentucky Blue Grass	....	....	....	3.57 "	....	....
Tall Oat Grass.....	....	....	1.78 "	....	....	....

Percentage Composition of Fertilizer Materials used as Sources of Nitrogen

	NITROGEN (N)			EQUIVA- LENT IN AMMONIA (NH 3			POTASH (K O) 2			PHOSPHOR- IC ACID (P O) 2 5		
Nitrate of Soda.....	15½	to	16½	19	to	19½	....	....	....	....	....	....
Sulphate of Ammonia.....	19½	to	20½	24	to	25½	....	....	....	....	....	....
Dried Blood.....	10	to	14	14	to	18	....	....	2	to	3	....
Concentrated Tankage.....	12	to	13	15	to	16	....	....	1	to	2	....
Tankage.....	7½	to	9	9	to	11	....	....	7	to	9	....
Dried Fish Scrap .	9	to	10	11	to	12	....	....	5½	to	7	....



Progressive Jones Says :

 **“Watch
for this
Sign”**

If you want to get right on the fertilizer question, friend, take my advice and visit the nearest agency for

Harab FERTILIZERS

You will know the Harab agency by the sign shown above. It will be found over the door of our dealer in your nearest town or village. Every agent is thoroughly posted about profitable fertilizing. I say here—that fertilizing the Harab way is like sowing pennies to harvest dollars, for it not only gingers up the present profits by providing a bigger crop—but also nourishes the soil for future dividends.

Every one of the Harab Fertilizers is a proven success—one of them is the right fertilizer for your soil and for the crop you wish to raise. Harab experts will give your enquiry individual attention. By their aid your proper fertilizer is easily selected.

The Harris Abattoir Company have an interesting booklet of information about their twenty-five successful fertilizers.

Just write for a copy to-day—and keep a weather eye open for the Harab sign—visit the Harab agency.



Yours for bumper crops,

Progressive Jones

Fertilizer Department
The Harris Abattoir Co., Limited
Toronto

CROPS

Quantity of Seed to Sow Per Acre.

Alfalfa (broadcast)	20 to 25 lbs.
Alfalfa (drilled)	15 to 20 lbs.
Barley	8-10 pecks.
Beans, field (small)	2-3 pecks.
Beans, field (large)	5-6 pecks.
Beets	4-6 lbs.
Blue grass	25 lbs.
Brome grass	15-20 lbs.
Brome grass (in mixture)	2-5 lbs.
Buckwheat	3-5 pecks.
Carrots (field)	4-6 lbs.
Clover, alsike	8-15 lbs.
Alsike (on wheat)	4-6 lbs.
Clover, mammoth	12-15 lbs.
Clover, red	8-14 lbs.
Clover, sweet	2 pecks.
Corn	6 quarts to 1 bushel.
Corn (silage)	9-11 quarts.
Cow pea	1-1½ bushels.
Crimson clover	12-15 lbs.
Field peas	2½-3½ bushels.
Flax (for seed)	2-3 pecks.
Flax (for fibre)	1½-2 bushels.
Hungarian grass	2 pecks.
Kaffir corn (fodder)	10-12 lbs.
Mangolds	5-8 lbs.
Millet, barnyard (drills)	1-2 pecks.
Millet, foxtails (drills)	2-3 pecks.
Millet, German (seed)	1 peck.
Oat Grass, tall	30 lbs.
Oats	2-3 bushels.
Oats and peas	Oats 2 bushels.
	Peas 1½ bushels.
Orchard grass	12-15 lbs.
Parsnips	4-8 lbs.
Popcorn	3 lbs.
Potatoes	10-14 bushels.
Potatoes (cut to 1 or 2 eyes)	6-9 bushels.
Potatoes, for best yield	14-20 bushels.
Rape (in drills)	2-4 lbs.
Rape (broadcast)	4-8 lbs.
Red Top	12-15 lbs.
Rye	3-4 pecks.
Rye (forage)	3-4 bushels.
Sorghum (for syrup)	2-5 lbs.
Sorghum (for silage)	6 lbs—½ bushel.
Sorghum and peas	3-4 pecks each.
Soy beans (drills)	2-3 pecks.
Soy beans (broadcast)	1-1½ bushels.
Sugar beets	15-20 lbs.
Sunflower	10-15 lbs.
Sweet clover	2-4 pecks.
Timothy	15-25 lbs.
Timothy and clover	Timothy 10 lbs.
	Clover 4 lbs.
Turnip (broadcast)	2-4 lbs.
Turnip (drills)	1 lb.
Vetch (drilled)	1 bushel.
Vetch (broadcast)	1½ bushels.
Wheat	6 to 9 pecks.



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Lime

Lime is a great aid to soil fertility. It sweetens sour lands, decomposes organic matter, liberates potash, renders clay more friable, makes sandy soils less porous, is one of the primary constituents of plant life, encourages clovers.

If absolutely pure lime is used it should contain 56% of lime or calcium or magnesium oxide and 44% carbon dioxide gas. This latter is discharged as gas when lime is burnt and thus in burning 100 lbs. of pure limestone we have but 50 lbs of actual lime left; there 100 lbs. of actual lime require 179 lbs. of stone lime to burn. The finest limes are quick, hydrated and marl. Agricultural lime or Caledonia marl is the most profitable, satisfactory and economical. It gives quick results. It can be applied at any time.

MATERIALS FOR BUILDING MANURE PITS

	10 Standard Head	20 Standard Head	30 Standard Head	40 Standard Head	50 Standard Head
Cement.....	40 bbls.	59 bbls.	94 bbls.	118 bbls.	145 bbls.
Yards sand.....	12	17.5	28	35	43
Yards gravel.....	24	35	56	70	86
"Triangle mesh" for reinforcement	660 sq. ft.	1089 sq. ft.	1980 sq. ft.	2640 sq. ft.	3320 sq. ft.
Rods, 3-8" round, ft.	550	750	1000	1200	1410
Gates, 58"x10'.....	2	2	2	2	2
Fencing, 1in. ft.....	85	112	166	192	225
Steel Posts, corners.	4-8x10	4-8x10	4-8x10	4-8x10	4-8x10
" " ends.....	4-8x10	4-8x10	4-8x10	4-8x10	4-8x10
" " line.....	4-8x13	4-8x13	6-8x13	8-8x13	10-8x13
Lumber.....	1000 B. F.	1200 B. F.	1700 B. F.	2000 B. F.	2300 B. F.
Labor:					
Excavating.....	75 yds.	128 yds.	230 yds.	300 yds.	383 yds.
Forms.....	6 man days	7½ man days	9 man days	11 man days	14 man days
Mixing and plac'g20	" "	27 " "	8 " "	60 " "	74½ " "
Removing forms, setting fence, etc..	4 " "	6 " "	8 " "	9½ " "	12 " "

Rules to be Observed in Purchasing Artificial Fertilizers

The purchaser ought always to demand a guarantee of the percentage contents of the various fertilizing ingredients in the fertilizer, as well as of the materials used as a source of the same. In nitrate of soda and sulphate of ammonia, the nitrogen content will have to be guaranteed.

In basic slag, of the total phosphoric acid, 80 per cent. ought to be soluble in citrate solution. The potash salts, both muriate and sulphate, contain 50 per cent. actual potash, and when purchased in the original sacks (225 lbs.), with lead seal attached, the purchaser may be confident that the goods are genuine.

Never Mix

Farmyard manure and lime.
Guano and lime.
Guano and boric slag.
Nitrate and superphosphate.
Sulphates and slag.
Superphosphate and slag.
Lime with sulphate of ammonia.

The Following May Be Mixed:

Superphosphate and sulphate of ammonia.
Bone and nitrate of soda.
Bone and sulphate of ammonia.
Bone and slag.
Slag and nitrate of soda.
Guano and mineral manure.
Organic manures with any mineral manures.

Analysis of Farm and Commercial Fertilizers.

	Nitrogen per cent.	Available Phos- phoric Acid per cent.	Total Phos- phoric Acid per cent.	Potash per cent.
Nitrate of Soda.....	15-16	.....	.....	.....
Sulphate of Ammonia.....	19-20	.....	.....	.....
Dried Blood.....	10-14	.....	.....	.....
Cottonseed Meal.....	6-7.5	.....	.....	2-3
South Carolina Rock Phos.....	.....	.....	26-28	.....
Ditto, dissolved.....	.....	12-15	13-16	.....
Florida Superphosphate.....	.....	14-16	16-20	.....
Bone Black Superphosphate....	.....	16-17	17-18	.....
Ground Bone.....	2-4.5	5-8	20-25	.....
Steamed Bone.....	1-2.5	6-9	22-29	.....
Dissolved Bone.....	2-3	13-15	15-17	.....
Thomas slag.....	.....	.....	11-23	.....
Muriate of Potash.....	.....	.....	.....	50
Sulphate of Potash.....	.....	.....	.....	48-52
Kainite.....	.....	.....	.....	12-12.5
Sylvinite.....	.....	.....	.....	16-20
Wood Ashes (unleached).....	.....	.....	1 to 2	2-8
Wood Ashes (leached).....	.....	.....	1-1.5	1-2
Tobacco Stems.....	2-3	.....	3-5	5-8
Cattle Excrement (solid).....	.29	.....	.17	.10
Cattle Excrement (urine).....	.58	.....	.....	.49
Hen Manure (fresh).....	1.10	.....	.85	.56
Horse Excrement (solid).....	.44	.....	.17	.35
Horse Urine (fresh).....	1.55	.....	.....	1.50
Human Excrement (solid).....	1.00	.....	1.09	.25
Human Urine.....	.60	.....	.17	.20
Pigeon Manure (dry).....	3.20	.....	1.90	1.00
Sheep Excrement (solid, fresh)..	.55	.....	.31	.15
Sheep Urine (fresh).....	1.95	.....	.01	2.26
Swine Excrement (solid, fresh)..	.60	.....	.41	.13
Swine Urine (fresh).....	.43	.....	.07	.83
Barnyard Manure (average)....	.49	.....	.32	.43

LINE OF DRAFT.

In illustration Fig. 81, page 14, is given the method of obtaining the correct draft on plow. A line connecting centre of draft A in mold board with attachment at bridle should line in the plane of the traces as shown by A, B, D. If it becomes broken, as in A, C, D, or 1, 4, 5, instead of 1, 2, 5, the draft of plow is made heavier.

Farm Drainage

To prevent alkalinity of soil by removing a superabundance of soluble salts. To keep a good circulation of air in the soil. To make soils warmer. To carry away excess of water. To conserve a sufficient amount of soil moisture. To give an earlier seeding period.

Conditions Requiring Drainage.

Comparatively flat lands on which water from the surrounding higher lands collect.

Extremely flat lands underlaid by an impervious layer of clay.

On extremely open soils where drainage will cause a more compact condition and then aid in retaining a greater quantity of water.

Deep drainage increases the growing depth of the soil by lowering the water table. It increases available moisture by causing a greater upward trend of the water low down in the soil. Soils are made warmer because being more aerated the warm air is allowed to penetrate to a greater depth.

Making a Survey.

The Departments of Agriculture for the different provinces of Canada will survey the farm, and then supply plan

of drains, location, cost, size of tile and all necessary information. Cost for survey is nothing, except the expense of boarding surveyor and supplying help to make the readings. Applications are attended to as they are received.

When the survey is made a plan of the system is sent by the surveyor. The meaning of the different lines and figures is somewhat hard to understand. Accompanying is a facsimile of a drainage plan and the following information explains it:

Explanation of Plan.

Dotted lines starting from station 2, N.E. end, shows the figures 18.0 ft. It means that the land tracing along that line has an elevation of 18 ft. Look at the elevation to the east of the 18 ft. contour; they are all less than 18 ft., hence the low land is to the east and the high land to the west. The next contour west shows an elevation of 19 ft. and hence there is one foot of fall from this to the 18.0 contour. The black lines indicate main drains and run through the lowest places possible. A change in grade is shown by the black triangle. (See cut.)

Distance Apart of Drains.

Drains should be at least three feet deep, 50 to 66 feet apart in clay and 66 to 100 in loam. In very heavy clay, as close as 30 feet.

Influence of Drainage on Time of Seeding.*

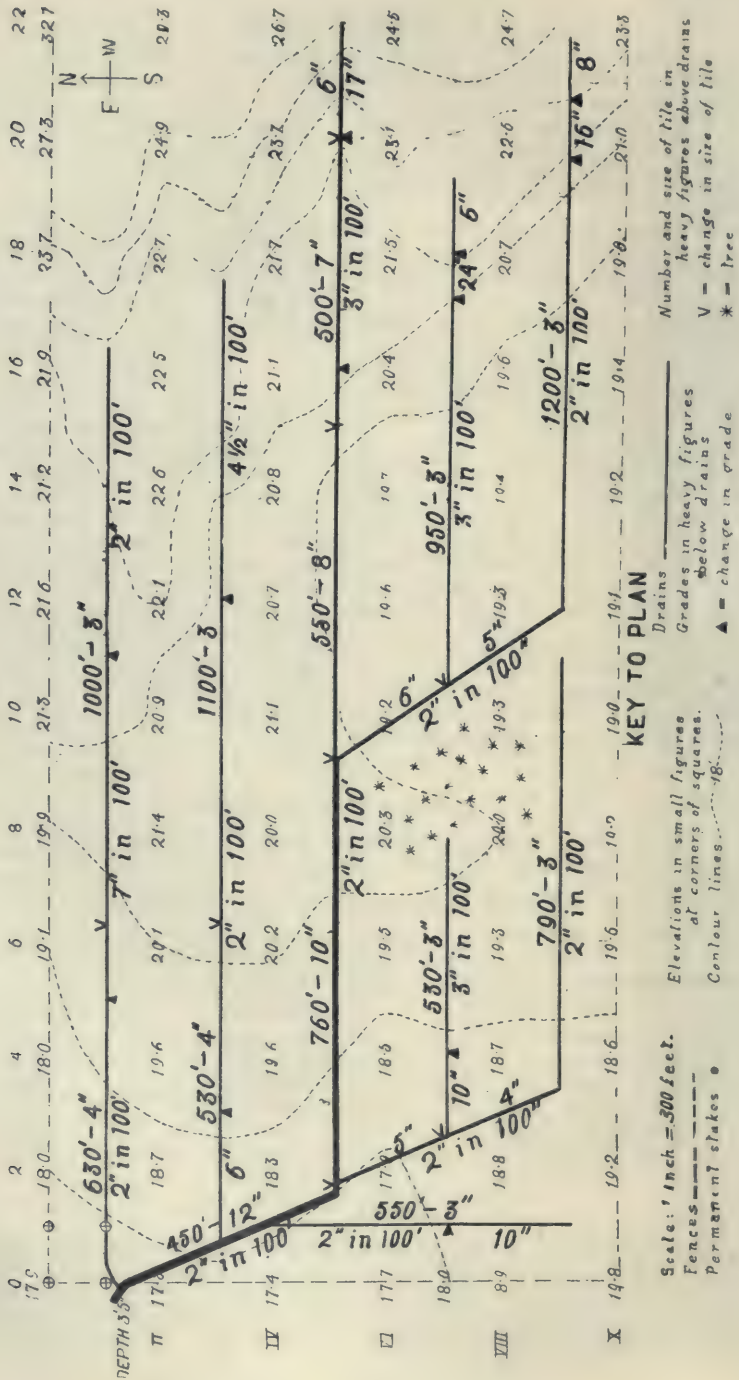
Table showing difference in dates of seeding drained and undrained land as reported by 26 farmers who have drained.

Difference in Seeding Time.	Number reporting each	Per cent.
Difference.		
1 to 2 weeks.	5 out of 26.	19.2
2 to 3 weeks.	4 out of 26.	15.4
3 weeks or over.	17 out of 26.	65.4
4 weeks or over.	13 out of 26.	50.0
5 weeks or over.	8 out of 26.	30.8
6 weeks or over.	6 out of 26.	23.1
A whole season.	4 out of 26.	15.4

THE RIGHT TILE TO USE.

A good drain tile should be hard burned, giving a clear ring when struck. Soft burned tile, which gives little or no ring when struck, are much more liable to crumble down under the action of frost. Clay containing pebbles of limestone will dissolve in water, and should not be used. Tile should be smooth and straight with square cut ends and true circular outline, so that the joints may be laid fairly close.

PLAN OF DRAINS



Determining the Fall Along a Ditch.

When a man wishes to determine the fall along a proposed ditch he sets up stakes 100 feet apart from the outlet to the source, numbering them 0, 100, 200, 300, etc. He is then ready to begin taking levels. He takes the home-made level and places it between stakes 0 and 100, as shown in Fig. 2, sinking the upright firmly into the ground as nearly perpendicular as possible about half way between the stakes and in line with them. If it is windy, special care should be taken to set the upright deep and firm, as otherwise it will tremble too much. He next places the level on the cross-piece and makes it horizontal by tilting and then using the thumbscrews. Two men are required to do the "levelling." A to sight and B to hold the staff (or measuring pole), and place a target (pencil or something similar) across the staff where directed. Fig. 3 shows them at work. The staff is first stood on the ground at stake 0 and A sights backward along the top of the level and directs B to raise or lower the target until it is in line with the level, and when correct B makes a note of the number of feet and inches the target is from the ground. When this is done B moves forward to stake 100 and stands the staff on the ground there and A, without moving the level, turns around and sights forward to the staff, directing B as before. When the target is just level with the instrument B again notes the reading.

In Fig. 2 the back reading was 4 feet 10 inches and the foresight 4 feet 1 inch. In both cases the target was level with the instrument, consequently the difference in reading must be due to the rise in the ground, and, therefore, the amount of rise must be 9 inches. The height of the instrument is immaterial—the difference between the two readings will be the same, whether the instrument is on high or on low ground. When the rise or fall from stake 0 to stake 100 has been determined the level is next placed about half way between stakes 100 and 200, and the rise or fall between them determined in the same way. The level is next set between stakes 200 and 300, and the same operation repeated, and so on over the whole course of the ditch. When this

is completed, all the rises or falls, as the case may be, are added together, giving the total rise or fall. If there are both rises and falls along the same ditch, as frequently occurs where a knoll or a hollow has to be crossed, the difference between the sum of the rises and the sum of the falls will give the net rise or fall. And when this is known, and also the length of the drain, it is an easy matter to find the rise or fall per rod or per 100 feet. And this enables one to decide whether he has fall enough for underdrainage. The fall in the ground surface, however, is not always a test of whether a man can underdrain, for he may put his drains deeper at the outlet than at the source and thus have more fall in the ditch bottom than on the surface. This we often find it necessary to do.

Ontario Agricultural College.

Note that in six out of the eight hundred feet sections there were rises, in the other two there were falls. The six rises total 4 feet 11 inches, and the two falls total 11 inches, hence, on the whole there was a net rise of 4 feet from stake 0 to stake 800.

The last column, "Elevation," needs a word of explanation. In comparing the altitude of different places, we use the sea-level as a datum plane, i.e., a given level of comparison. Toronto Bay is 250 feet, the Agricultural College at Guelph 1,150 feet "above the sea," from which we learn by subtraction that the College is 900 feet above the Bay. In a similar way we compare the elevations for different points along a ditch, but in surveying the latter we cannot use the sea as a datum, for we do not know how much stake 0 is above the sea, hence we must choose an arbitrary datum.

In the example given we have chosen it ten feet below the ground surface at stake 0. Then the elevation of the surface above this datum plane at stake 0 is 10 feet. Since there is a rise of 9 inches to stake 100, its elevation will be 10 feet 9 inches, and so on with all other stakes. To find the rise from any one stake to any other, we have only to subtract the elevations as given in the last column. For instance, the rise from stake 0 to stake 800 is 14 feet, minus 10 feet, equalling 4 feet,

the same as we obtained by subtracting the total falls from the total rises. Thus the last column, while not absolutely essential, is the most convenient means of comparing any one

our survey at the source instead of at the outlet, we would choose for the elevation of the starting point some height greater than the total fall to the outlet. If starting station with any other.

Mushrooms

Success in mushroom growing depends on intelligent study of conditions and on experience. While many American growers have been successful in the production of mushrooms, a much larger number have failed. In most cases their failures have been due to one or more of the following causes:

(1) The use of poor spawn, or of spawn which has been killed by improper storage.

(2) Spawning at a temperature injuriously high.

(3) The use of too much water either at the time of spawning or later.

(4) Unfavorable temperature during the growing period.

It is therefore important to the prospective grower that careful attention be given to the general discussion of conditions which follows.

Temperature and Moisture.

Mushrooms may be grown in any place where the conditions of temperature and moisture are favorable. A shed, cellar, cave, or vacant space in a greenhouse may be utilized to advantage for this purpose. The most essential factor, perhaps, is that of temperature. The proper temperature ranges from 53° to 60° F., with the best from 55° to 58° F. It is unsafe to attempt to grow mushrooms on a commercial basis, according to our present knowledge of the subject, at a temperature much less than 50° or greater than 63° F. Any severe changes of temperature retard growth, or else act injuriously, and many changes of temperature would entirely destroy the profits of the mushroom crop. From this it is evident that in many places mushrooms may not be grown as a summer crop. With artificial heat they may be grown almost anywhere throughout the winter. Moreover, it is very probable that in this country open-air culture must be limited to a few sections, and

restricted, commercially at least, to a single season.

A second important factor is that of moisture. The place should not be very damp, or constantly dripping with water. Under such conditions successful commercial work is not possible. A place where it is possible to maintain a fairly moist condition of the atmosphere, and having such capability for ventilation as will cause at least a gradual evaporation, is, by general practice and by the most extensive experimentation, shown to be necessary. With too rapid ventilation and the consequent necessity of repeated applications of water to the mushroom bed no mushroom crop will attain the highest perfection.

Caves, Cellars, and Houses.

Cellars, caves and abandoned mines, or specially constructed houses, (fig. 3) are used for growing mushrooms, because in such places only can the conditions of temperature and moisture be best regulated. Cold is less injurious to mushroom beds than heat. The former renders the bed for a time unproductive; but the latter stimulates the spawn to too rapid growth, which is usually followed by the production of unsaleable mushrooms, or by the eventual death of the spawn, supposedly by damping off.

Mushrooms may often be grown in a very simply constructed shed or unused barn which will provide against any sudden changes of the temperature, and when it is possible to employ artificial heat the season for mushroom production in such structures may be greatly extended. Cellars are very commonly used in producing mushrooms for family use. Natural or artificial caves are of the first importance, however, for commercial work, since the situation of these below the surface will best insure a temperature throughout almost the entire year more or less close to that which is desired. In selecting

caves or cellars, one should guard against the possibility of flooding or of too much seepage water during a rainy season. Perhaps the least satisfactory situation among those mentioned is the greenhouse. Under ordinary circumstances it heats up too readily during days of warm sunshine, and, unless special precautions are taken, it is not to be generally recommended for amateurs. Nevertheless, during the fall and winter it is possible to grow mushrooms under the benches or in any other unused space with but very little outlay of money or labor. Cold frames may also be used to good advantage during the autumn or spring. The natural caves of this country and abandoned coal mines in some sections should be further investigated with relation to their adaptability for the commercial production of mushrooms. A thorough study should also be made of open air conditions.

In the construction of special mushroom houses any one of a variety of plans may be followed, and the selection of the style will depend, of course, upon its cheapness and efficiency in the particular locality.

Preparation of the Manure.

It should be borne in mind that while there are many methods leading to failure there are a number leading to success. In fact, persons succeed in mushroom growing by methods which seem absolutely different. It is essential that the physiological conditions of growth be understood, and then good judgment must be depended upon.

In the growing of mushrooms for commercial purposes, the beds should be constructed of horse manure which has been fermented or composted. Many experiments have been made looking toward the substitution of other composts or waste products for horse manure, but nothing has yet been found which may be more highly recommended. Fresh manure should be obtained, and this should include the litter used for bedding the horse, unless the latter consists of coarse weeds. It is a great mistake, in a commercial way, to attempt to use manure free from straw. Again, stable manure which has been well trampled is nearly always well preserved, and is frequently much richer than any other kind.

The manure should be piled in heaps about 3 feet deep when well pressed down with the fork, and these piles may be of considerable extent. It should be watered until well moistened throughout, but not drenched. In the course of four or five days or a week it will be necessary to fork over or "turn" the manure. A second turning will be required usually in from seven to ten days, and it may be necessary to water again if the material has suffered considerable drying out. If well pressed down and merely moist, the manure will not burn and, moreover, there will be no tendency for a sour fermentation to become established. In from fifteen to twenty-one days, depending upon the conditions, the temperature will begin to fall, the violence of decomposition will begin to show a subsidence, and the compost will be ready for the construction of the beds.

Preparing the Beds.

Mushroom beds are of two general types, (1) the flat bed, frequently referred to as the English, and (2) the ridge bed, known as the French type. In making the former the entire floor space may be utilized as a bed, and the beds may be arranged in the form of tiers or shelves, as shown in figure 4. In low cellars or caves, and, indeed, wherever the amount of floor space is not the most important consideration, it would be well to avoid the use of shelves; but where the amount of floor space is an important factor they may be adopted to advantage, although the additional labor involved in the growing of a crop under such conditions is an item to be considered. When shelves are used one should be careful to white-wash these after each crop in order to avoid the increased danger from insect depredations. In any case, flat beds should be made from 3 to 10 inches deep.

Ridge beds enable one to get a somewhat greater surface space in a given area, but they are also more expensive so far as the labor of construction is concerned. Nevertheless, under many circumstances they are obviously desirable. They should be about 2 feet wide at the base, tapering gradually to the apex, and not more than about 18 to 20 inches high when compressed and cased. The

custom is to make two such beds in contact, and then to leave a walk way of 8 or 10 inches between the next two, and so on till the space is occupied. Next to the walls slanting beds may be prepared.

Spawning.

After the beds are prepared the temperature should be, and it usually will be, too high for spawning. After a sudden rise the temperature should gradually fall during the course of a week or more to about 70° or 75° F. At this temperature spawning may take place, but under absolutely no circumstances should a bed be spawned at a temperature greater than 80° F. If brick spawn is used, the bricks are broken into pieces about 2 inches square, or into from 10 to 12 pieces per brick. These pieces are inserted from 1 to 2 inches below the surface, about 10 inches to 1 foot apart, and the bed is then compressed into final shape. Under the most favorable circumstances it is unnecessary and undesirable to water the beds for several weeks after spawning, or until they are loamed or cased. If they dry out rapidly and some water is

necessary, it should be given as a surface spraying, for water in quantity applied to the young spawn will almost invariably cause the latter to damp off.

Casing the Beds.

An examination of the bed about two weeks after spawning is desirable, and if it is found that the spawn is "running" the beds may be cased with loam. Casing consists in applying a layer of loam from 1 to 1½ inches deep to the surface of the bed. This loam should have been secured some time in advance and carefully worked over or screened to get rid of the largest pebbles, lumps, and trash. When applied it should be barely moist. Subsequently, if watered at all, it should be merely sprinkled in order to prevent any drying out of the bed. Neither a heavy clay nor a sandy loam should be used for casing purposes, but almost any other soil is good.

As previously indicated, the spreading spawn should receive no water, or, at least, as little as possible. When, however, the mushrooms are dry sprinkle lightly, especially after picking.

ORCHARD AND GARDEN

Mulching.—This signifies a dressing of some kind usually manurial, which is placed over the surface of the soil surrounding tree, shrub, or plant of some kind. Its object is to keep moisture within the soil, to prevent the direct action of the sun on the roots, and when waterings are given, particularly in summer, to wash down the good qualities of the manurial covering for the fibres to assimilate. Mulchings should be given more frequently, especially in the case of plants transferred from one place to another.

Restoring Old and Sickly Trees.—Branches or snags that have to be removed should be sawn off quite close to the trunk or limb from which they spring. An application of liquid tar to the wound and renewed once or twice protects against moisture and fungoid diseases. When the new bark has grown over the wound, the tree may be considered safe. The life of a tree decayed in the centre may be prolonged by filling up the holes with cement, and thus keeping out moisture, which is the point to note in the preservation of old or decaying trees.

Room Plants.—Parlor palm (*Aspidistra*), true palms, india-rubber plant (*Ficus elastica*), *Arabia* *Sieboldi* and *Pteris* *Argyrea* and *Hepprolepsis* ferns, withstand draughts better than most plants. Always water room plants with tepid water, that of the same temperature as the room itself being advisable. Bulbs, such as daffodils, hyacinths and tulips should be grown more often in bowls and pots. With the special fibre now available, there is little difficulty in doing so. Sponge the leaves occasionally of smooth and thick foliaged plants with tepid water to remove dust which stops up the pores—hence decay.

Pots for Flowers.—These are obtainable from the nurseryman in various sizes, the most frequently used being the 48, as it is called, or "five-inch" in width, the next being the "six-inch," and there are also the small ones, called "thumbs," which

are generally used for the small ferns so much used for decorations. Never use new pots until they have been soaked in water for quite 48 hours, as unless they are treated in this way they absorb moisture from the soil. Dirty pots must be well washed and dried before plants are put in them, and if covered with green substance, scrubbed in strong soda water made hot. Dry well. Crocks or drainage to give free egress for water from the soil should consist of broken pieces of pot and over the hole in the bottom of each pot place a large rather concave bit, then smaller chips or rubble, not overdoing it, to allow free egress of the water. Unless this precaution is taken the soil soon gets waterlogged and sour.

Transplanting Trees and Shrubs.—In dealing with trees and shrubs transplanting is an important detail. There are two leading points, the most suitable time and the method. The best season to transplant evergreens is in late spring, failing this, the fall. Transplant deciduous trees and shrubs in the spring when frost is out of the ground. In transplanting keep the fibrous roots as far as possible intact, and remove with them a large ball of soil, the larger the better. When moving a large deciduous tree or shrub first dig a trench all round it with a fork far enough away to preserve the roots. Lay a damp mat over them while they are exposed. Prepare the site for the tree by digging out a hole large enough to allow the roots being spread out evenly all round and to their full extent. Break up the soil finely, especially that which actually touches the fibres. In planting follow the general rule of not burying that part of the stem from whence the uppermost roots spring more than 2 inches or 3 inches.

Syringing and Spraying.—These are two distinct operations. The object of syringing is to cleanse and refresh the foliage, especially in the evening of a hot day, a large squirt being used which sends out the water either in a stream or from a "rose," the popular name for the nozzle, the

water from the latter being in the form of a spray which may be compared to dew or fine rain. This is most efficacious in the case of mildew and insect attacks, and when mixed with chemical preparations. Water should not be directed with strong force to plants, otherwise bruises will result.

Tying Up.—This is a common practice in gardens. It means tying up plants with string, raffia or bast or other material, with the help of neat sticks and stakes. The lettuce called "Cos" is thus treated to solidify the heart or centre, celery, dahlias, chrysanthemums and roses, the last three familiar instances among plants. Never make the tie so tight that the plant's development is impeded. It should be made secure, but no more.

Watering.—Though an apparently simple operation this needs judgment. Never give water unless the soil is in real need of it. An old gardener's advice is: "Plants in pots are best when occasionally allowed to become root dry, but only for a moment, as the drying of the soil sweetens it, then the soil should be well saturated." If the soil seems moderately damp do not give more moisture. Never water in dribbles, but always give a good soaking so that every fibre receives benefit.

Scarlet Harmonies.—Here are general rules: Scarlet and rose colors, the tints respectively of the Oriental poppy and many of the herbaceous poenies should never be allowed in close proximity, but scarlet and crimson merge agreeably with orange and yellow, and the latter with straw color, ivory white and white. The different shades of purple and blue form in themselves quite a color graduation, the lighter blues associating through pale yellow with white, while blue and mauve also harmonize with soft yellow. The latter color may also be used in juxtaposition to pink and rose tints. In this manner, though discordant colors may be represented in the same flower border, they may be disposed in such a way by surrounding them with allied color tones, melting by infinite degrees into others that by gentle graduations eventually harmonize with the opposing hue, as to produce a delightful effect.

Budding.—An operation which applies to one form of tree and shrub propagation. It consists in removing with a proper knife known as a "budding knife," a dormant leaf with a small piece of the bark attached and transferring it to the shoot or stem of the plant to which it is to be attached. The rose is frequently the subject of budding, and fruit trees may be treated in the same way. The stock, that is, the shoot or stem on which the bud is to be inserted, should be opened, and the latter placed just underneath, with only the bud germ exposed, then tied firmly in position.

Orchid.—A genus or family of plants, sometimes terrestrial or living in the soil in the way of most plants, and epiphytal, or living on trees, nourishment being derived from moisture in the air; these are tropical. Orchids are found in almost all quarters of the globe, and are not, as is often surmised, simply wild flowers of tropical jungles. A vast majority are easily grown.

Chrysanthemums.—The name given to a significant class of flowers, some perennial, others annual. They add greatly to the beauty of the greenhouse and conservatory in the fall months, when the more modern varieties are in full beauty. The parent of this modern race first flowered in the British Isles in 1790, plants having been sent from China, the home of the chrysanthemum, and also Japan, to a French nurseryman at Marseilles, named Blanchard.

Shrubbery.—A place in which flowering and other shrubs are grown for decorative effect.

Deciduous.—Signifying a tree or shrub that loses its foliage in the fall and remains bare until spring.

Evergreen.—A tree or shrub that keeps its leaves throughout the year.

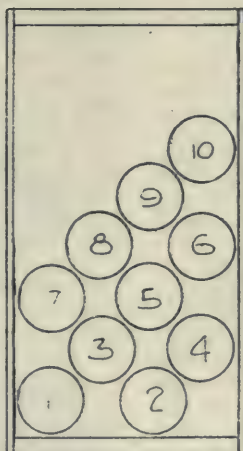
Compost.—A name given to a mixture of soils and manure. The soil usually used for plants to be grown in pots consists of fibrous loam, well-decayed leaf-mould, old hotbed manure, such as is obtained from a mushroom bed, and sharp silver sand, the major portion consisting of the first named.

Frames.—A small, usually wooden, contrivance for the sheltering and propagation of plants. It is of the

Methods of Apple Packing in Canada



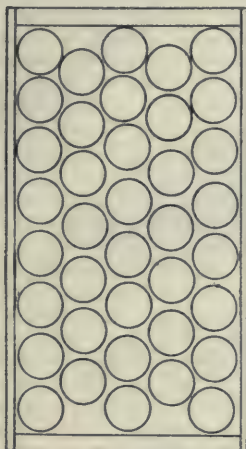
HOW TO START A
DIAGONAL 3-2 PACK



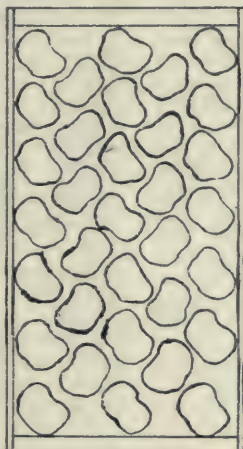
HOW TO START A
DIAGONAL 2-2 PACK



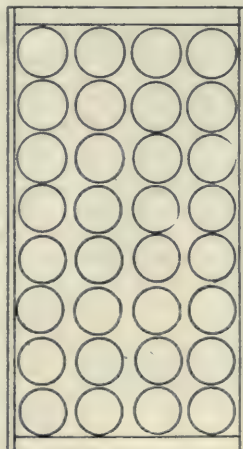
HOW TO PLACE
1ST AND 2ND LAYERS



5 LAYERS
188 APPLES



RIFF RAFF
54 APPLES



4 LAYERS
128 APPLES

greatest use in gardens, whether large or small, and is very inexpensive to construct.

Annual Flowers.—Those that bloom the same year as the seed is sown and then die, and they embrace two classes, hardy and half-hardy, a good example of the former being the sweet pea, and of the last mentioned the china aster.

Biennial Flowers.—These sometimes through early sowing will produce plants that flower the same year, but this is simply a matter of cultivation. A biennial means a plant that flowers the year after the seed has been sown, and the hollyhock may be cited as an example. The sowing takes place in early summer.

Everlasting Flowers.—These are real flowers, although their appearance when dried suggests that they are composed of some paper-like material. The immortelles, so called from the years they will remain in much the same condition, are among the best known of the everlastings. *Rhodanthe* and *Helichrysum* are types.

Levelling a Lawn.—Levelling or grading are regarded as difficult operations, but this is not so. An absolutely flat surface is not always either necessary or desirable. Advice may be summed up as follows:—Having worked the main body of soil as nearly level as the eye will guide, after a glance from more than one direction, decide what shall be the height. Set a shallow brick here and at some point several feet distant place another. Upon these a piece of stiff quartering or a narrow board that will not sag should be set, and a common spirit level used to get this perfectly horizontal, raising or lowering the bricks until this is obtained. Put a little soil to this, or remove, as necessary. Repeat this operation from various positions, always taking care that the first guide brick set is always on the level. Of course each other brick, after it is adjusted, will be of the same height, and can be taken as a guide accordingly. A strong piece of string tightly stretched from point to point, is a good guide in the earlier stage, and by driving a few pegs at various parts of the ground, the tops of which are at the desired level, all risk of movement will be avoided.

Turf for Lawns.—This should be obtained from fields fed over fraternally by sheep, but as a rule excellent lawns are obtainable from the best seed mixtures, each nurseryman usually having his own preparation. When turf, however, is used, it is absolutely necessary that it should be free from weeds, particularly twitch, dandelions, plantain and thistles. Cut each turf about 3 inches deep and roll them grass side downwards until they are used, which should be as soon as possible. When the turf is set spread over it some loamy soil, which work in well with a broom into the crevices. Roll and sweep well and give plenty of water during the first summer especially.

Lawn Grass.—This should never be cut until it has grown quite two inches after growth has begun in the spring, and then only at first clipped off, in the case of freshly made lawns in particular. A close watch should be kept for weeds. Roll the lawn occasionally.

Dimensions of Tennis Lawn.—A full court should be as follows:—Length, 78 feet; width, 36 feet; and for single court, a width of 27 feet; the net to be in the centre and extend 3 feet over each side of the court. Height at the ends $3\frac{1}{2}$ feet, centre 3 feet, and service lines 21 feet from the net on each side. Total area of lawn to give ample space on outside of court should be 120 feet by 66 feet.

Hardy Flowers.—A class of plants not affected by frost, that is, will live the year through.

Garden Tools.—These are of several kinds, each adapted to a certain purpose, the principal implements being the spade, fork, hoe, rake, saw, and small cultivator, which accomplishes good work and is very useful in saving time. Always take care of tools, allotting them a place apart, and cleanse well after use.

Labels.—The use of labels may be overdone, but trees, shrubs, flowers and vegetables that are not familiar should be clearly named. These may be made of zinc, and obtained from the nurseryman, or, in the case of fleeting things, such as annuals and vegetables, strips of wood, the surface made smooth and painted over

INSECTS INJURIOUS TO CROPS AND STOCK.

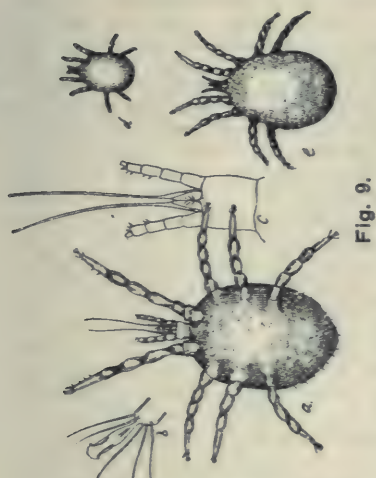


Fig. 9.

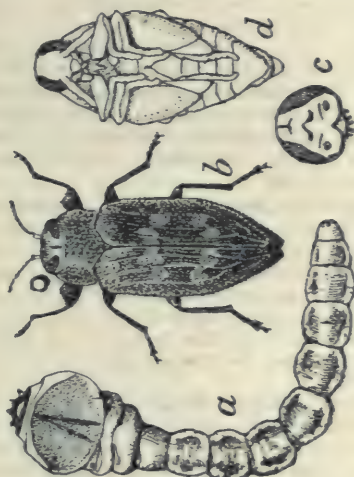


Fig. 10.



Fig. 12.



Fig. 11.

Fig. 9.—Chicken mite: (a) adult mite; (c) mouth parts; (d) young mite; (e) more mature mite.

Fig. 11.—Grape Vine Flea Beetle: (a) Adult beetle; (b) grub; (c) grub and beetles on foliage; (d) injury to buds; (e) beetles killed by fungus.

Fig. 10.—Flat-headed apple-tree borer showing grub or borer (a); adult beetles (b); and pupa (d).

Fig. 12.—Asparagus beetle (steel blue species): (a) beetle; (b) egg on leaf; (c) young grub; (d) grown grub; (e) pupa.

with white paint, will serve admirably.

Wasps' Nests.—To destroy these many ways are adopted, but a very simple one is to get a strong stick and wrap a wad of rag at the top of it. Soak the rag in tar and thrust it quickly into the hole of the nest at night, after having lighted it. Then stop up the entrance with a thick piece of turf.

Mowing Lawns.—This is gardening work that requires care. It is certainly not everyone that can use the lawn mower aright. Before any mowing is done, roll the lawn well, if the grass is poor, lightly, if not, with more vigor; in the former case once in ten days, in the latter, every two weeks.

Turfy Loam.—This term is used to denote a soil made up of loam of grassy matter, such as from a pasture and roots, their fibry character rendering the material friable, that is, neither too loose nor too hard and sticky. When this pasture "turfy loam" has decayed well it forms the purest plant soil that it is possible to obtain. A proportion of two-thirds clay to one-third sand is perfect. Stones, of course, should be eliminated.

Bulb.—This is frequently used incorrectly. A tuber is often called a bulb, and vice versa, but the true bulb is made up of layers or scales which enclose the germ. The hyacinth is an excellent example of a true bulb.

Scion.—The name of a graft or piece of stem to be inserted in the stem of a tree of which it is to become part.

Grafting.—This operation must take place when the sap is on the move, that is, in spring, and both small and large stems may be selected for the purpose. Many fruit trees are grafted, and this is needful to obtain abundant crops quickly, pears and apples being particularly responsive to this process. The writer has described this gardening practice before in the following words. It consists in placing a piece of stem of one variety of fruit, that may be 6 inches long and the size of a man's finger or less, on to the crown of a small stem, singly, or putting several on the several stems of a large bunch. Grafts are called scions. The graft should be cut into a length of a few inches.

On one side of the lower or base end a slice of bark 3 inches long is cut off, leaving the base end with a point, or wedge-shaped. Then the graft is ready for insertion on the stock. The head should be cut clean off, and the stem be quite free from any side-shoots below. With a sharp knife a slit has to be made down the back of a large stem, and that being lifted at the edges, the slit point of the graft is forced firmly into the slit in the stock, then tied round tightly, and coated with either wax or clay to exclude air. If a small stock, then a slice is taken off the bark of that 3 inches long, and by an upward cut, so when the sliced end of the graft is placed on it, an even fit results. The edges of the bark on both stock and scion must meet to effect a proper union. Tie round the two with bast or raffia and coat the edges with grafting wax, or the whole stem with clay, the object of this being to exclude the air from the portions united together. This describes the general process.

Blanching.—A term used frequently when describing some form of vegetable culture. It is necessary with not a few vegetables to what is called blanch them, that is, exclude the light to render them edible. Asparagus, celery and rhubarb will at once occur to mind as kinds usually subjected to this treatment. In these instances, when the stems are given full exposure to the air and light they are rendered bitter and hard. Blanching is effected by placing the vegetables in a dark place, such as under a greenhouse stage or in specially prepared pits, or when in the open ground covering up closely; the object is to exclude the light.

Division.—In reading text books upon gardening the term "division" occurs frequently, and all it means is simply the operation of dividing the roots of certain plants, of which the perennial larkspur or Delphinium may be given as an example. The original roots in due course become too large and must then be divided into portions when growth is beginning in spring. Use a sharp knife or spade for the purpose.

Drainage.—Of course the general use of this word is well known, but in gardening it applies not only to the soil, such as in the preparation of paths, lawns, and so forth, but to

flower pots. Thus we frequently read in books "the pots should be well drained," which means that in the bottom place pieces of pot, or, as they are called, "crops," to enable superfluous moisture to pass away easily.

Drilling.—This word applies to one item in the sowing of the seed, of which there are two general ways, broad-casting and drilling. In the former the seed is thrown widely but evenly over the piece of ground upon which a crop is desired. Drilling means that shallow furrows or drills are made with a hoe or sharp pointed stick, or with a hand drill, which is very inexpensive, this not only making the drill, but sows the seeds also. Careful drilling means that the seeds are sown at equal depths, and there is no waste of material.

Feeding.—This term is often used in books. It means giving food in either liquid or concentrated form to plants for the promotion of a more abundant crop, whatever that crop may be.

Forcing.—Many fruits, vegetables and plants are brought to maturity by artificial warmth, and that is called forcing. It is a term much used in connection with horticulture.

Layers.—A method of propagation much practised in the increasing of certain trees and plants. A very familiar instance is the carnation, which is usually propagated in this way.

Leaf Mould.—A very valuable material, used chiefly in soil prepared for pot plants. It may be summed up in the following description: "The product of tree leaves." The way to get a good supply is to collect the tree leaves and stack them whilst damp in a heap to decay. If they are dry when collected, soak them in water.

Moulding Up.—At first this strange term may seem difficult to explain, but this and blanching have about the same significance. It means drawing earth to the stem. One excellent illustration is in the case of the potato, the forming tubers being kept from light and air by moulding up the soil to the young shoots. Bush or dwarf roses are also moulded up to protect the bark—the most valuable part—from injury.

Peat.—Every garden should possess its bin of peat, that is, where plants are grown under glass. It is made chiefly of vegetable fibre and

some portion of sand, some orchids and ferns in particular requiring some portion, larger in some cases than in others, in the soil in which they are planted.

Cuttings.—These are slips or pieces of young growth of the plant, and when properly made in preparation for going into the soil, they are called "cuttings." About 1-3 of their length is inserted, and the soil that promotes the formation of strong roots most quickly is that in which sand forms a large part. In due course basal roots are emitted, and the life of the young plant has begun. The base of the cutting should always be just beneath a leaf joint, and two, sometimes three, of the lower leaves removed to give a clear space for insertion in the soil.

Runners.—A few plants are increased or propagated by what is known as the "runner," and the strawberry is chiefly multiplied in this way. The strawberry sends out trailing shoots, and at the end of each of these a little plant is formed which is to give the fruit of the future. Take these off in August or spring and plant in the places in which they are to fruit.

Pruning.—Unless certain classes of fruits are pruned more or less there is no crop, or very little, and that little poor. Thousands of orchards are in sorry plight through neglect of this practice. There are two forms, stem and also root pruning. It is often essential to prune the roots when a tree is making too much leaf and branch growth, which is at the expense of the fruit. There is an absence of fruit spore. This operation requires much care and judgment, and is done by opening a trench at a fair distance from the stem of the tree of sufficient width and depth to get hold of the roots and sever them. In very neglected orchards it is wise to do one-half this year and the other the next to prevent too great a strain on the tree. To get hold of the downward roots dig underneath the ball of soil. When the root pruning has been carefully carried out the beneficial effect is soon seen on the growth and fruit bearing of the trees.

Trenching.—This term is used to denote double digging or deep tilling of the soil, and thus treated the crops

are more abundant than by any ordinary method of cultivation. The way to proceed is as follows:—A trench two feet wide and one foot deep should be thrown out half way across the piece of ground to be worked. Take up the bottom soil a further 12 inches deep, and the 12 inches of the next 2 feet trenching must be thrown on that, breaking up the bottom soil also. Treat the entire piece in this way and when it has been thus manipulated the bottom may be brought to the top. The whole plot is then fertile.

Thinning.—This term is applied to an act the purport of which is to reduce the number of flowers or fruits on a plant or tree to throw greater size into those remaining. The huge chrysanthemums, for instance, that are seen in our gardens, are obtained by reducing the buds to one on each stem or stalk. With regard to fruit trees it signifies the removal of both large and small branches with a saw to reduce crowded growths or those which cross each other. Always cut close to the main stem, make the surface of the wound smooth, then smear over with tar. Thinning out of vegetables invariably takes place to give each seedling proper space for its full development.

Stocks.—The name of a flower and also of a hard stem and root which is the means of increasing roses, fruit trees, and such like. The stock has an influence on the flower itself, or on the fruit of the tree. It is simply a means whereby the various kinds can be rapidly increased.

Spawning.—This word is generally used in connection with the cultivation of mushrooms. The spawn is obtainable in the form of a dry cake of soil and manure which contains the mycelium or thread-like roots, which give rise to the delicious product that is so well known.

A Rock Garden.—This is a portion of garden set apart for the flowers that delight in the surrounding of stone and rock, such as those from the mountains of the world. Gentians, edelweiss, and a host of other plants, may be grown in this section of the home surroundings. At least 18 inches of soil should be taken out so as to provide ample drainage, anything approaching stagnation being

fatal to success. Plants, such as our lady slipper or orchid (*Cypripedium spectabile*), require a soil that may be described as "boggy," a word which needs no explanation. A rock garden should not be made on the level, but where all inequalities have to be formed imitate Nature as far as possible should be the keynote.

Growing Early Vegetable Plants.

Success in market gardening depends largely upon reaching the market early when prices are good and produce finds ready sale. To accomplish this it is necessary to grow strong, thrifty plants which have been hardened and ready for the field the first day weather and soil conditions are favorable for transplanting.

Work usually begins in the fall. Some growers, however, prepare the soil during the spring and summer by first making an application of manure in the spring and then plowing the plot several times during the course of the season. Additional manure may be added at the second plowing if vegetable matter is wanting. Other growers go to the trouble of stacking manure and thick sods in alternate layers of eight or ten inches a year in advance of the time when the soil will be needed. When quite well decayed the pile may be turned several times at intervals of ten days or two weeks. The first plan is more economical and just as satisfactory. Other growers prefer to select any good garden soil and add rotten manure as may be required.

Preparation of Soil.

In the selection of soil, it is important to consider several factors: (1) It should be free from fungus diseases, as club root and other maladies that might cause trouble. Fields which have been producing any of the crops to be started under glass should be avoided in the selection of soil. (2) Stones, sticks, and other rubbish should be screened out. (3) Soils containing a great many weed seeds should not be used. (4) A considerable quantity of sand is always desirable. If the soil does not contain this naturally, it can often be procured at small cost and added as may seem desirable. Sand is especially valuable in starting tender seedlings. The addition of plenty of rotten manure to any good farm soil

will usually put it in good condition for growing vegetable plants.

Both the soil and manure should be procured in the fall before the hard freezing weather and stored in the dry where they will not be frozen hard when wanted for use, probably in mid-winter. The neglect of this matter is certain to cause annoyance. It is best to store the soil during September when it is quite dry and may be screened if necessary. A convenient way to do this is to place a screen with a half-inch mesh over a low wagon, slanting it so the stones and coarser parts will run onto the ground.

Sterilization is being practised more and more by plant growers. It destroys troublesome weed seeds and greatly reduces losses from fungus diseases. There are two common methods, by steam and formaldehyde. There are various ways of applying the steam. One of the most thorough is to place the soil in tight tanks, admitting steam at high pressure. The soil should be subjected to very high temperature for not less than an hour, and a longer period is an advantage.

When formaldehyde is used the soil is soaked with a solution made by adding one and one-half quarts of this solution to fifty gallons of water. One gallon of the diluted solution should be applied to each square foot of the soil.

Sowing the Seeds.

The grower should know the vitality of his seeds before sowing. This may readily be determined by making a simple test several weeks before it is time to make the main sowings. Count one hundred seeds of each variety to be tested and plant in separate rows. The number of plants which come up may then be counted and the germinating power accurately determined, and the thickness of sowing regulated accordingly.

Seeds may be sown in rows or broadcast. The row method takes more time, but it is preferable. The plants then come up with greater regularity. They are likely to be straighter and can be handled more rapidly. When the seed is sown in rows the plants help each other in reaching daylight, and this is an important point if there is much clay in the soil. The plants from rows may be lifted more rapidly and are kept in better order when transplanting,

and these advantages more than offset the extra time required in sowing.

Length of Life of Various Seeds

Vegetables.	Years.
Cucumber	8—10
Pumpkin	8—10
Melon	8—10
Squash	8—10
Cauliflower	5—6
Artichoke	5—6
Endive	5—6
Pea	5—6
Radish	4—5
Beets	3—4
Cress	3—4
Lettuce	3—4
Mustard	3—4
Akra	3—4
Rhubarb	3—4
Spinach	3—4
Turnip	3—6
Tulip	2—3
Asparagus	2—3
Bean	2—3
Carrot	2—3
Celery	2—3
Corn	2—3
Leek	2—3
Onion	2—3
Parsley	2—3
Parsnip	2—3
Pepper	2—3
Tomato	2—3
Eggplant	1—2
Herbs	3—4
Anise	1—2
Caraway	1—2
Savory	1—2
Sage	2—3

Time Required to Germinate

Vegetables.	Best temp.	Days.
Bean	75°	5—10
Beet	60°	7—10
Cabbage	70°	5—10
Carrot	60°	12—18
Cauliflower	70°	5—10
Celery	60°	10—20
Corn	75°	5—8
Cucumber	80°	6—10
Endive	60°	5—10
Lettuce	60°	6—8
Onion	60°	7—10
Parsnip	60°	10—20
Pea	65°	6—10
Pepper	80°	9—14
Radish	60°	3—6
Tomato	80°	6—12
Turnip	70°	4—8

Bearing Years of Fruits

	Years.
Apple	25—40

Blackberry	6—14
Currant	20
Gooseberry	20
Peach	8—12
Pear	50—75
Plum	20—25
Raspberry	6—12
Strawberry	1—3

Distance in Planting

	Feet.
Apple	30 x 40
Apple (dwarf)	10 x 15
Pears	20 x 30
Pears (dwarf)	10 x 15
Plums	16 x 20
Peaches	16 x 20
Cherries	16 x 25
Apricots	16 x 20
Nectarines	16 x 20
Quinces	8 x 14

Number of Plants per Acre at Various Distances.

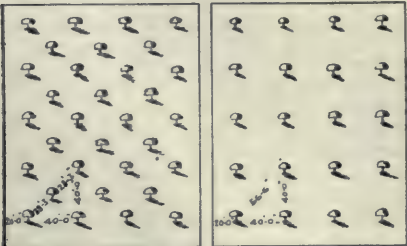
Distance.	Plants.
1 in. x 10 in.	627,279
1 in. x 12 in.	522,720
2 in. x 10 in.	313,632
2 in. x 12 in.	261,360

Arrangement of Orchard.



HEXAGONAL

ALTERNATE



QUINCUNX

SQUARE

3 in. x 12 in.	174,240
4 in. x 12 in.	130,680
6 in. x 12 in.	87,120
12 in. x 12 in.	43,560
12 in. x 15 in.	34,848
12 in. x 18 in.	29,040

12 in. x 24 in.	21,780
12 in. x 30 in.	17,424
12 in. x 36 in.	14,520
12 in. x 4 ft.	10,890
12 in. x 5 ft.	8,712
15 in. x 18 in.	23,232
15 in. x 2 ft.	17,424
18 in. x 20 in.	17,424
3 ft. x 5 ft.	2,904
4 ft. x 4 ft.	2,722
4 ft. x 5 ft.	2,178
5 ft. x 5 ft.	1,742
5 ft. x 6 ft.	1,452
6 ft. x 6 ft.	1,210
6 ft. x 7 ft.	1,037
6 ft. x 8 ft.	907
7 ft. x 7 ft.	888
8 ft. x 8 ft.	684

Useful Orchard Insects

Bees—Pollenizes and indispensable to a continuance of reproduction of a large percentage of plant life.

Dragon Flies—Feed on a great variety of injurious insects.

Tree Crickets—Feed on plant lice.

Ground Beetles—In larvae and adult stages feed on such insects as go underground to pupate.

Lady Bug Beetles—Feed on plant life and scale insects both in larvae and adult stages.

Wasps—Beneficial because predatory upon other insects, some of an injurious, destructive nature.

Frogs and Toads—Feed almost entirely on insects and slugs.

Cost of Cover Crops for Orchard

The following figures are comparative. The prices may vary considerably. Lower prices may be secured by buying through associations or in large bulk:

Cow peas, 1½ bus. per acre at \$3.00 per bus.	\$4 50
Mammoth Red Clover, 20 lbs. per acre at 18c.	3 60
Common Red Clover, 20 lbs. per acre at 17c.	3 40
Crimson Clover, 25 lbs. per acre at 14c.	3 50
Winter Vetch, ½ bus. per acre. .	4 25
Spring Vetch, 1 bus. per acre. .	1 80
Barley, 2 bus. per acre at 75c. per bus.	1 50
Peas, 1½ bus. per acre at \$1.10 per bus.	1 65
Alsike, 20 lbs. per acre at 15c. .	3 00

Top Grafting

Top grafting promotes hardihood in apples. Varieties as McMahon, Tol-

man and Baxter are hardy stock to graft onto Kings and Canada Red and such like varieties from weak crotches which canker badly; scions of these are therefore grafted onto hardier varieties. Illustrations show methods of top grafting.

Formulas for Grafting Wax.

Resin, 4 parts by weight; beeswax, 2 parts; tallow, 1 part. Melt together and pour into a pail of cold water. Grease the hands and pull the wax until nearly white.

For cold weather: 6 lbs. resin, 1 lb. beeswax, and 1 pint linseed oil. Apply hot all over joints with a brush. Put on about 1/8 inch thick.

For warm weather: 4 lbs. resin, 1 lb. beeswax, 1/2 pint to one pint linseed oil. Melt together gradually, turn into cold water, and pull. The linseed oil should be entirely free from cottonseed oil.

Plant Food removed from an acre by a bearing apple orchard in twenty years:

Apples .....	.....
Leaves .....	.....
Trees .....	.....

Total .....	.....	.....
Nitrogen, lb.	Phosp. acid, lb.	Potash, lb.
498.6	38.25	728.55
456.75	126.00	441.00
283.15	107.45	264.25
1,238.50	271.70	1,443.80

Age of Trees to Plant

Apples, 2 to 3 years.
Pears, 2 to 3 years.
Plums, 2 years.
Cherries, 2 years.
Peaches, 1 year.
Apricots, 1 year.
Grapes, 1 to 3 years (cutting).
Gooseberries, 2 years (cutting).
Currants, 2 years (cutting).

Raspberries, 1 year (cutting).
Blackberries, 1 year (cutting).

Hints to Packers.

Use only clean, neat boxes.

Use only one size—20 x 11 x 10.

Use diagonal pack when convenient.

Keep the pack, if anything, above the "Fruit Marks Act."

Use the proper size paper for wrapping.

Avoid turning stem of one apple to cheek of another.

Pack firmly and of correct alignment.

Make the pack attractive.

Mark the number of apples on the box.

All fancy priced apples should be shipped in boxes.

Only the best grades are preferred.

The box is the only practical pack for transportation.

Packing Apples in Boxes

The Straight Pack: Rows run straight across box and parallel to sides, in boxes of three, four, and five tiers. Apples must fit snugly. Sometimes necessary to turn end row flat. Stem end up.

Diagonal Pack, most important style: Rows go at an angle. It includes the two-two pack (see illustrations). First place an apple in the left-hand lower corner of box and another midway between the cheek of the first apple and the right-hand side of box. Two spaces of equal size will be left. In these spaces two apples are placed. The spaces left by last two apples are then filled, and so on until layer is finished. Second layer is started in right-hand corner for the half tier packs. This throws the apples of second layer into the pocket left by first layer. The three-two pack is the same, except that it is started with three apples instead of two. For these packs it is necessary to have the apples too large to fit four across the box.

BOOKS ON THE SUBJECT OF INSECTS

Injurious Insects: How to Recognize and Control Them. By W. C. O'Kane \$2.00
The most complete work on the subject that has yet appeared. The 600 illustrations are one of the special features

The Fungi Which Cause Plant Disease. By F. L. Stevens. Illustrated \$4.00
Sent post-paid for the above prices.

THE MACMILLAN CO. OF CANADA, LTD. TORONTO.
(Send for descriptive catalogue.)

SPRAY CALENDAR

Plants and Pest

1st Application

2nd Application

APPLE

Scab or black spot, canker, leaf spot, codling moth and other biting insects, scale insects, blister mite and aphids.

Shortly before the buds burst. Use A1 or B.

Just before the blossoms open. Use A2 or D, with 2 or 3 lbs. arsenate of lead.

PEAR

Scab or cracking, blight, codling moth, other biting insects, scale insects, blister mite, psylla and slug.

Shortly before the buds burst. Use A1 or B.

Just before the blossoms open. Use A2 or D, with 2 or 3 lbs. arsenate of lead.

PLUM AND CHERRY

Black-knot, brown rot, leaf blight or shot-hole fungus, curculio, slug and aphids.

Just before the buds burst. Use A1 or B.

Just after fruit is set. Use A2 or D, with 3 lbs. arsenate of lead.

PEACH

Leaf-curl, scab or black spot, yellows, little peach, curculio, borer, San Jose scale, shot-hole borer.

Before the buds begin to swell. (All must be done before any sign of bursting of buds.) Use A1 or B.

Just after fruit is set. Use 2 lbs. arsenate of lead alone with water for curculio.

GRAPES

Black rot, powdery mildew, downy mildew, anthracnose, flea-beetle thrip, or leaf hopper.

When 3rd leaf is appearing. Use D.

Just before the blossoms open. Use D.

SPRAY CALENDAR

3RD APPLICATION

REMARKS

Immediately after blossoms have all, or nearly all, fallen, and before the calyces close. Use A3 or D, with 2 lbs. arsenate of lead. This is the application for codling moth.

Cut out, disinfect and paint or cover with coal tar, cankered areas on trunks and large branches. In moist climates, or if the weather is wet or foggy, give a 4th application with A3 or D or Scab about two weeks after 3rd. See if aphids are present just before leaf buds burst; if so, spray at once with Black Leaf 40 or kerosene emulsion or whale-oil soap.

Just after blossoms have fallen. Use A3 or D, with 2 lbs. arsenate of lead.

Cut out and burn blight as soon as seen, cutting always one foot or more below diseased areas. Disinfect tools after each cut. In moist or in foggy or wet weather give a 4th application of A3 or D about two weeks after 3rd. For Psylla, spray thoroughly with A1 or B just after buds burst, or with Black Leaf 40 just after leaves open. For slugs spray with arsenate of lead or dust fresh air-slaked lime over the leaves.

About two weeks later. Use A3 or D, with 3 lbs. arsenate of lead.

Watch for black-knot and whenever seen cut out well below diseased area and burn. If leaf blight is troublesome, give a 4th application with A3 or D as soon as fruit of cherry is picked. Destroy mummied plums in autumn. Look for aphids just before buds burst, and if present spray at once with Black Leaf 40 or kerosene emulsion or whale-oil soap. Treat slug as on pear.

About one month after fruit is set. Use C.

If brown rot is likely to be troublesome use C again about one month before fruit ripens. Destroy mummied fruit in autumn. Remove at once and burn any tree attacked by yellows or little peach and also all suspected trees. Dig out borers at base of tree with knife in May and again in October. For shot-hole borer cut down and burn before April all dead or dying trees or branches, and leave no brush heaps near orchard.

Just after fruit sets. Use D.

Spray again whenever wet weather threatens. It should always be done before, not after rain. At first sign of powdery mildew dust with sulphur or spray with C. For flea-beetles use poison whenever they appear. For leaf-hoppers or "thrips" use Black Leaf 40 or kerosene emulsion or whale-oil soap in July to destroy nymphs. Clean cultivation is very important, and destruction of all old mummied grapes and prunings.

CURRANT AND GOOSEBERRY

Mildew, leaf-spot, currant
worm and aphids.

Shortly before buds
burst. Use A1 or B.

Just before blossoms ap-
pear. Use A2, with 2
lbs. arsenate of lead.

RASPBERRY AND BLACKBERRY

Anthracnose, red rust,
crown gall.

Before growth begins.
use D.

When shoots are 6 or 8
inches high. Use D
and add poison if cater-
pillars are present.

STRAWBERRY

Leaf-spot and white
grub.

For leaf-spot set out only healthy plants with no
sign of disease. First season spray with D before
blossoms open and keep plants covered with mix-
ture throughout the season. Second year spray
before blossoming with D and again soon after
picking; or mow and burn over after picking.
Don't take more than two crops off. Plow down
at once after second crop. For white grubs dig
out as soon as injury is noticed. Do not plant
on land broken up from old meadow or pasture
for at least three years after breaking.

CABBAGE AND TUR- NIP

Flea-beetles, caterpillars,
root maggots, aphids.

For flea-beetle or turnip sow after June 21st, or
dust plants as soon as they appear above ground
with Paris green, or spray with Bordeaux and a
poison and a sticker. Repeat in two or three
days. For caterpillars dust with Paris green until
heads begin to form on cabbage and cauliflower,
then spray with pyrethrum, 1 ounce to 2 gallons
water. For root maggots use medium thick
tarred felt-paper discs, putting on as soon as
plants are set out, or set out plants after July 1st.
For aphids use kerosene emulsion as soon as they
appear.

POTATO

Tip burn, early blight,
late blight, scab, Col-
orado beetle, flea-
beetle.

Keep foliage covered with D from time plants are
about 5 inches high. Take special precautions to
see this is well done if weather is at all damp after
about 15th July, as late blight begins about this
time. Add a poison to each application when
necessary. For scab, soak tubers before cutting
2 hours in formalin solution, 1 pint of formalin to
30 gallons of water. Spread out on grass to dry.
Wash all boxes, bags or other vessels to be used in
same liquid. Plant none but perfectly healthy
tubers.

Just after fruit is formed. Use A2, with 2 lbs arsenate of lead.	For worms when fruit is ripening, use hellebore. Look for aphids just before buds burst; if present spray with Black Leaf 40 or kerosene emulsion or whale-oil-soap. Of little use to spray for these after leaves curl.
BEAN Anthracnose and bacterialiosis.	If anthracnose is very severe, set out new plantation of healthy shoots. If disease begins, cut out old canes and as soon as fruit is picked, also badly-attacked new ones, and burn. For red rust remove and burn plants at once. No other remedy. For crown gall set out plants in fresh soil, rejecting any plant with a gall on root or crown.
TOMATO Leaf blight, black rot, flea-beetle.	Get seeds from pods showing no signs of disease. Do not work among the plants if they are wet with rain or dew. Spraying scarcely pays, as a rule. Spray plants in seed-bed with D. Keep foliage in field covered with D until danger of staining fruit. Add poison if necessary for flea beetles.
ASPARAGUS Rust, beetles.	For rust, let no plants, not even wild ones, mature during cutting season. Late in fall when growth is about over, cut and burn old plants. For beetle, let poultry run in the plantation. After cutting season is over spray with arsenate of lead; repeat in two weeks. May add sticker and a little lime.

NOTE—A1—Concentrated lime-sulphur, strength 1030 specific gravity (1032 for San Jose scale)—commercial lime-sulphur diluted 1 to 8 or 9.
A2—Concentrated lime-sulphur, strength 1009 specific gravity = commercial lime sulphur diluted 1 to 33.
A3—Concentrated lime-sulphur, strength 1008 specific gravity = commercial lime-sulphur diluted 1 to 39 or 40.
B —The old home-boiled lime-sulphur, 20.15.40 formula.
C —Self-boiled lime-sulphur.
D —Bordeaux mixture, 4.4.40 formula.

<p>SEEDS For the Farm For the Garden</p>	<p>ASK FOR CATALOGUE Geo. Keith and Sons Seed Merchants Since 1866 124 King St. E. Toronto</p>
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FORMULAE FOR INSECTICIDES

I.—POISONS (for biting insects only).

- 1.—ARSENATE OF LEAD—2 or 3 lbs. to 40 gallons liquid spray; $3\frac{1}{2}$ lbs. for potato beetles.
- 2.—PARIS GREEN—(a) $\frac{1}{4}$ to $\frac{1}{2}$ lb. to 40 gals.; 1 lb. for potato beetles. If used with water alone, add 1 to 2 lbs. fresh lime. (b) 1 lb. mixed with 50 lbs. land plaster, air-slaked lime or some similar substance, for dusting on plants. (c) Poisoned bran, mix 1 lb. Paris green with 50 lbs. bran moistened with sweetened water. Scatter in evening on soil by plants for cutworms.
- 3.—ARSENATE OF LIME.—Boil 1 lb. white arsenic and 1 lb. sal. soda (crystals) with stirring for about 15 minutes in 1 gal. water till the arsenic is dissolved, then add 2 lbs. stone lime and let slake in boiling liquid. Add water to make up for what has evaporated. One quart of this when well stirred is sufficient for 40 gals. spray liquid. Arsenate of lime can be made in large quantities and stored. Label barrel "poison," and be careful to keep white arsenic itself labelled "poison." Keep barrel covered to prevent evaporation. Stir well before using.
N.B.—With Bordeaux, 1, 2 or 3 may be used; with lime-sulphur 1; the others cause burning.
- 4.—WHITE HELLEBORE.—1 oz. to 2 gals. water, or dust undiluted over the plants. For root maggot dust close to plants, or pour around roots.

II.—CONTACT POISONS (chiefly for sucking insects).

1.—KEROSENE EMULSION—

Kerosene (coal oil)	2 gals.
Rain water	1 gal.
Soap	$\frac{1}{2}$ lb.

Dissolve the soap in water by slicing and boiling; take from fire, and while hot pour in kerosene and churn vigorously for five minutes. For use dilute with 9 parts water, so that the above 3 gals. of stock emulsion will make 30 gals. of spray mixture.

- 2.—WHALE-OIL SOAP.—For brown or black aphids, 1 lb. in 4 gals. For green aphids, thrip and leaf-hopper, 1 lb. in 6 gals.
- 3.—TOBACCO WATER.—Steep 1 lb. refuse tobacco in 2 gals. of water for 1 hour, make up for water that evaporates.
- 4.—Black leaf 40, sold by Tobacco Product Co., Louisville, Kentucky.
- 5.—PYRETHRUM (or insect powder).
Pyrethrum Powder 1 oz.
Water 2 to 3 gals.

Dry mixture. Mix thoroughly 1 part by weight of pyrethrum with 4 of cheap flour, and keep in air-tight vessel for 24 hours before dusting over plants.

Note.—Pyrethrum is useless if left exposed to the air.

6.—LIME-SULPHUR WASH—

(See under fungicides.)

FORMULAE FOR FUNGICIDES

I.—BORDEAUX MIXTURE—

Copper Sulphate (Bluestone).....	4 lbs.
Unslaked Lime.....	4 lbs.
Water.....	40 gals.

Dissolve the copper sulphate in a wooden or brass vessel with hot water, pour into a barrel and add cold water to make 20 gals.; slake the lime preferably with hot water; add cold water to make 20 gals.; stir both barrels well, and pour lime into the copper sulphate barrel. (Never mix concentrated milk of lime and copper sulphate solutions.)

A stock solution of each may be made and kept indefinitely if not mixed. Dissolve 40 lbs. copper sulphate in 40 gals. of water by suspending just below the surface of the water in a coarse sack. Each gallon of the liquid will now contain 1 lb. copper sulphate. Slake any desired quantity of lime and put into a box or barrel in shaded place, or sunk in the ground. Keep covered with small amount of water to exclude the air. Calculate how much is required for 4 lbs. lime if well stirred. To test Bordeaux mixture, let a drop of ferro-cyanide of potassium solution fall into a little of the mixture in a saucer, when ready. If this causes it to turn reddish brown, add more lime until no change takes place.

II.—LIME-SULPHUR WASH.

1.—HOME-BOILED (for use on dormant wood only.)

Fresh stone lime.....	20 lbs.
Sulphur (flour or flowers).....	15 lbs.
Water.....	40 gals.

Slake 20 lbs. of lime in about 15 gals. boiling water in a kettle or other boiling outfit. While slaking add the 15 lbs. sulphur made into paste by the addition of a little water. Boil vigorously, with stirring, for 1 hour. Dilute to 40 gals. with cold or hot water. Strain and apply at once.

HOMEMADE CONCENTRATED LIME-SULPHUR.—This may be used as a substitute for commercial lime-sulphur, but is only about two-thirds as strong as a rule.

Sulphur (a fine grade).....	100 lbs.
Fresh stone lime, high in percentage of calcium..	50 lbs.
Water.....	40 or 50 gals.

Put about 10 gals. of water in the boiling outfit, start fire, add sulphur, stir to make paste and break lumps, then add remaining water, and when near boiling put in lime. Stir frequently while slaking and till all the sulphur and lime are dissolved. Add water from time to time to keep up to 40 or 50 gal. mark. Boil 1 hour, then strain through a screen of 30 meshes to inch to storage barrels. Make enough at once for season's work. Cover well to keep out air, or pour oil of any kind over surface to depth of one-eighth inch for same purpose.

3.—SELF-BOILED (chiefly for use on peach foliage.)

Freshstone lime.....	8 lbs.
Sulphur (flour or flowers).....	8 lbs.
Water.....	40 gals.

Best prepared in quantities of 24 lbs. at a time to get sufficient heat. Place 24 lbs. lime in a half barrel, add enough cold water to start it slaking well and to keep the sulphur off the bottom. Dust the 24 lbs. sulphur over the lime, having first worked the sulphur through a screen to break lumps, then add whatever further amount of water is necessary to complete the slaking. Stir well with a hoe to prevent the lime caking on the bottom. As soon as the slaking is over, add enough cold water to cool the whole mass and prevent further combination. Strain into spray tank. Keep well agitated while spraying.

III.—DISINFECTANTS (for pruning tools and for wounds on trees).—

- 1.—One pint formalin diluted to 2 gals. with water.
- 2.—Corrosive sublimate, 1 part to 1000 by weight = 1 tablet to 1 pint of water. Apply with a swab on end of a stick.

Caution.—Corrosive sublimate is a deadly poison to man or beast if taken internally. It will also corrode iron or metal, so use in a glass or wooden vessel and be sure to wash these out very thoroughly when through using them.

- 3.—Lime-sulphur about twice spring strength, or bluestone, 1 lb. dissolved in about 14 gals. water may be used to disinfect wounds or cankers, but is not satisfactory in case of pear blight.

STICKER

Resin.....	2 lbs.
Sal Soda (crystals).....	1 lb.
Water.....	1 gal.

Boil together till a clear brown color, which takes from 1 to 1½ hours.

Cook in an iron kettle in an open place. Add the above to 40 gallons

Bordeaux for use on smooth foliage like onions, cabbage or asparagus.

If used with arsenate of lead, Paris green, or arsenate of lime, add 1 to 2 lbs. of fresh lime to every 40 gallons of spray.

Spraying Fruit Trees

Spraying of Young Trees.

As one of the main objects of spraying is to keep the trees healthy and vigorous, by warding off insects and diseases that attack the trunk, branches, leaves and foliage, it clearly follows that every tree, no matter how young, should be sprayed carefully. Young orchards not yet bearing should receive the same attention as the older orchard, but in the cases of the second and third applications the bearing orchards should receive attention first.

Preparation of Trees for Spraying.

It is advisable to scrape the loose bark off the trunks and larger branches of old apple trees, once every

four or five years. All trees should be pruned before spraying. Young trees should not be allowed to grow more than twenty feet high at most. All prunings should be burned and large wounds covered with white lead or coal tar to keep out moisture and prevent rot.

How to Spray.

In case of high trees, it will be necessary to use a small tower a few feet high, in order to do thorough work. The frame of this can be built with 2 x 4 inch scantling. Spray with the wind, it will help to drive the spray more forcibly through the trees. Keep up as high pressure as your engine can stand. When approaching

a tree spray as far in on the side nearest as possible, then move opposite and spray that part, next, move a little past it and spray it on that side, also as far as possible.

The man in the tower, with his ten-foot rod, should do a little more than half of each tree, leaving the man on the ground the lower branches to spray, and time enough to touch up any twigs or branches in the inner part of the tree that could not be reached from the tower or without getting in very close to them. The 35 feet of hose this man has will enable him to finish the last half of one tree while the man on the tower is spraying the nearer part of the tree in front. Then, when the team steps on, he can finish the nearer part of this tree while his companion is spraying the farther part of it. In this way the man on the ground will escape being drenched by his companion.

In the first spraying, every part of the tree—trunk, branches and twigs—should be thoroughly covered to control scale insects, blister mite, or other insects or diseases that lime-sulphur is a remedy for. If San Jose scale is abundant, give an extra application for it either in autumn, as soon as most of the leaves have fallen, or in spring, a few days earlier than the regular application; and of the same strength as it.

The second regular application, which should be given as soon as the pink begins to show on the blossom buds of the early varieties, should be made with small or medium-sized holes in the plates of the nozzles, so that the spray will be in the form of a fine mist. The foliage this time should be well covered, and the branches and trunks of younger trees. The trunks of old trees need not be sprayed.

The third spraying must be given immediately after about 90 per cent.

of the bloom is off. If there are many early-blooming varieties, these may be sprayed first, and then the later ones afterwards; but, if there are only a few early varieties, wait until the bloom is about 90 per cent. off the orchard as a whole, and then go ahead. The bees will be through feeding by this time. (It is unlawful to spray in full bloom or when the bees are feeding.) Too much care cannot be given to getting this application on as soon as possible after blooming is over, because this is the spray for the codling moth, and, as a large majority of these insects enter the apples at the calyx end, we can only control this pest by thoroughly poisoning every calyx before it closes. If you watch the calyx or little tops of the young forming fruit, you will see these close up in about a week after the blossoms drop, and after that it is impossible to get any poison in; but, if it has been put in before they closed, it remains there all summer, and kills the worms whenever they try to enter.

The codling-moth spray must be most thorough, and not a single young forming fruit should be missed. Plates for the nozzles with the larger holes should be used, and the poison driven right into the calyx end. A large tree that has had an abundance of bloom will require from six to eight, or even more, gallons of spray to do it thoroughly. It has been frequently found impossible to get every calyx thoroughly sprayed without literally drenching the trees. Of course, a tree that has had very little bloom will require very little spray mixture—just enough to wet each of the calyces and to cover the foliage. Trees that have had no bloom may be left till the rest of the orchard has been finished, and then be given a fine mist spray to keep the leaves healthy.

As a rule, we find that trees 30 years of age and upwards require

about 4 gallons for the first application, 4 or 5 for the second, and from 6 to 10 for the third.

It is very important to keep the mixture well agitated, especially when arsenate of lead is added to lime-

sulphur, as this forms a new chemical change, and much of the poison will, unless well and frequently stirred, settle to the bottom, and thus some trees will receive a great deal of poison, and others scarcely any.

Distance of Planting

Plant	Distance Apart of 'Standards' each way	Time of Fruiting	Annual Yield (average)	Profit'ble Life
Apple.....	30x20 ft.	3 yrs. good in 6-8 yrs.	20-20 bus. in alternating yrs.	40-60 yrs
Cherry.....	20x16 ft.	3 " " 8-10 "	3-5 bu. in alternating yrs. per tree.	30-40 "
Currant.....	6x 4 ft.	1 " " 2-3 "	100 bus. per acre	15-20 "
Gooseberries..	6x 4 ft.	1 " " 3-4 "	100 " " " "	15-20 "
Peach.....	20x16 ft.	2 " " 3-4 "	5-10 " " tree	8-12 "
Pear.....	30x20 ft.	3-4 " " 6-12 "	25-35 " " " "	50-60 "
Plum.....	20x16 ft.	3 " " 8-10 "	5-8 " " " "	30-40 "
Raspberry...	6x 3 ft.	1 " " 2-3 "	50-100 " acre	8-12 "
Strawberry...	3x 2 ft.	1 " " 2-3 "	75-250 " " "	4-5 "

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INSECTS INJURIOUS TO CROPS AND STOCK.



Fig. 5.



Fig. 6.

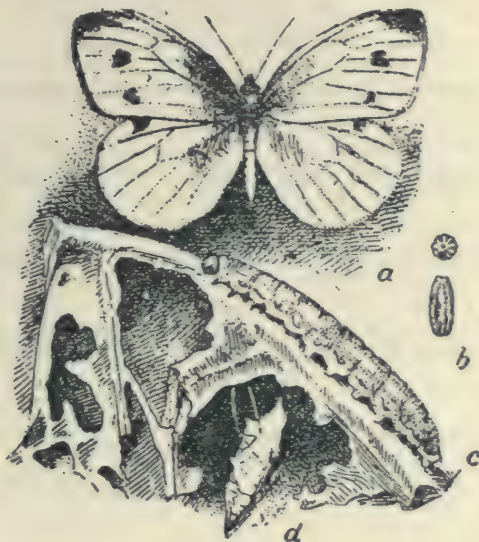


Fig. 7.

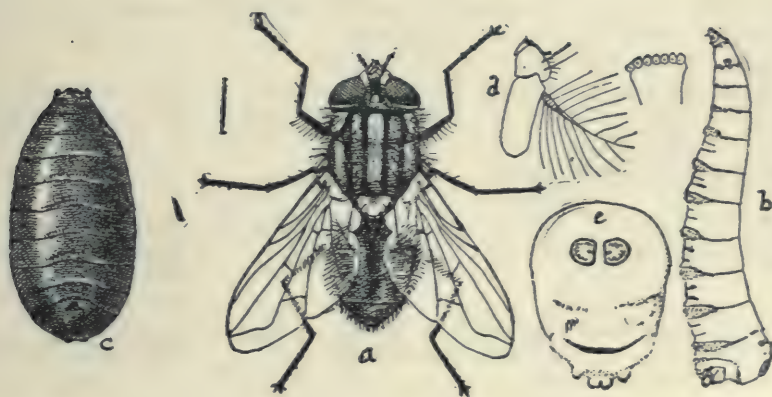


Fig. 8.

Fig. 5.—Potato flea-beetle.

Fig. 6.—Squash bug.

Fig. 7.—White cabbage butterfly: (a) moth; (b) eggs; (c) caterpillar; (d) chrysalis.

Fig. 8.—The common house-fly: (a) adult fly; (b) maggot; (c) puparium; (d) details of feeler; (e) end of body of maggot.

W E E D S

NAME	ORIGIN	TIME OF FLOWERING	TIME OF SEEDING
Burdock.....	Europe	July to September	August to October
Bindweed.....	Europe	June to September	August to October
Blue Weed.....	Europe	July to October	August to October
Canada Thistle.....	Europe	June to August	July to September
Couch-grass Twitch, Quack.....	Europe	June to July	July to August
Chess.....	Europe	June	July
Corn Cockle.....	Europe	June and July	August
Campion, white	Europe	June to August	July and August
Campion, bladder.....	Europe	June to August	July to September
Dock.....	Europe	July to August	July and August
Dodder.....	Europe	June and July	August and September
Falseflax.....	Europe	June to August	July and August
Foxtail.....	Europe	July to September	August to October
Hawkweed.....	Native	July and August	August and September
Paint-brush			

WEEDS

IDENTIFICATION	DURATION	PLACE OF GROWTH	METHOD OF CONTROL OR DESTRUCTION
Erect branching, with large roots	Biennial	Everywhere	Cut off below the crown, and if in seed, burn the tops.
Running or climbing vine	Perennial	Grain field and gardens	Difficult to eradicate, constant cutting below the surface.
Erect, hairy	Biennial	Fields and waste place, sand and gravelly soil	Thorough cultivation is always sufficient. In fence-corners, etc., cut below the crown.
Erect, branching	Perennial	Everywhere	Frequent cultivation, cutting just when the blossom buds are on. Pasture sheep on them.
Creeping, from a jointed root stock	Perennial	Fields and gardens	Constant cultivation is about the only effective remedy.
A coarse grass	Annual	Fields and waste places	Hand pulling in grain, and avoid fall sown crops. Sometimes taken for degenerated wheat.
Erect, branching, flowers purple	Annual	Grain fields	Sow clean seed. Hand pulling in grain.
Erect, branching, hairy, flowers white or pink	Biennial	Grain fields and waste places	Sow clean seed. Hand pulling in grain. Cultivate stubble lands two or three times in the fall.
Erect, branching, flowers white	Perennial	Everywhere	Likely to become troublesome. Frequent cultivation of infested fields and hand-pulling.
Leaves, with strongly curled margins; flower, stem erect from a spindle shaped yellow root	Perennial	Everywhere	Cut off below the crown with hoe or cultivator.
Parasitic, climbing over other plants, and feeding on their sap	Annual	Mostly in fields and gardens	Sow clean grains and seed. Hand-pull it before it ripens seed. Likely to become very injurious.
Erect, branching, flowers small, yellow	Annual	Cultivated fields	Fall cultivation of stubble fields. Hand-pulling in grain.
An erect grass	Annual	Everywhere	Frequent fall cultivation. Plant hoe crops on infested land.
Erect, coarse herb	Perennial	Fields and meadows	Frequent fall cultivation in tillable lands. On meadows, broadcast one ton and a quarter of salt to the acre. A bad weed in Quebec.

WEEDS

NAME	ORIGIN	TIME OF FLOWERING	TIME OF SEEDING
Hound's Tongue	Europe	July and August	August and September
Mustard Charlock. . . .	Europe	June to September	June to September
Oxeye Daisy	Europe	June to August	June to September
Purselane.	Europe	May to October	June to October
Pennycress.	Europe	June to September	June to September
Pigweed Red-root. . . .	Tropical America	July to September	August to October
Plantain (Several spe- cies)	Europe	June to September	June to September
Ragweed.	Native	July to September	August to November
Wild Oat.	Native	July	July and August
Sow Thistle	Europe	June to August	July to September
Sorrel.	Europe	June to October	June to October
Wormseed Mustard. . . .	Native	June and July	June to September
Cow Cockle.	Europe	July and August	July to September
Wild Lettuce.	Europe	June to September	July to October
Russian Thistle.	Russia	July to September	August to November
Shepherd's Purse	Europe	May to November	June to November
Lamb's Quarters.	Europe and America	June to October	July to November
Tumbling Mustard. . . .	Europe	June to September	July to September
Ball Mustard.	Europe	June to August	July to September
Hare's Ear Mustard. . . .	Europe	June to August	July to September.

WEEDS

HABIT	DURATION	PLACE OF GROWTH	METHOD OF CONTROL AND DESTRUCTION
Erect, hairy, coarse herbs; flowers reddish-purple; seed, a round burr, flat on one side.	Biennial	Waste ground and pastures	A bad pest where sheep are kept. Cut below the crown.
Erect, branching flowers, showy, yellow	Annual	Everywhere	Hand-pulling and burning. Frequent cultivation of stubble fields after harvest. Never let a plant go to seed.
Erect, branched; flower white with yellow eye, large and showy.	Perennial	Pastures, hay fields and waste places	Mowing infested fields early in June is recommended. Ordinary cultivation will destroy it in tilled land.
Prostrate, creeping leaves and stem fleshy	Annual	Gardens mostly	Frequent cultivation in fields and eternal hoeing in gardens.
Erect, branched, towards the top	Annual	Grain fields	A bad weed in Manitoba and spreading in Ontario. Mowing the patches and burning the plants are the most effective remedies.
Erected, branched	Annual	Rich fields and gardens	Frequent fall cultivation, ploughing infested fields after harvest, before seed ripens.
Leaves prostrate; flower stem erect	Perennial	Everywhere	Burn or mow stubbles immediately after harvest. Keep hoe crops cultivated as late as possible.
Erect, branching	Annual	Everywhere	Keep cultivated as late as possible.
Erect aerial; the lawn is covered with brown hairs	Annual	Everywhere	On infested fields grow hoed crops or fallow.
Erect, stem leafy	Annual	Fields and waste places	Cultivate immediately after harvest, and follow with hoed crop.
Stem erect from running root stocks	Perennial	Everywhere, but chiefly in sour, poor soil	Application of lime to infested land and frequent cultivation will eradicate the weed.
Erect, branching, flowers yellow	Annual	Everywhere	Cultivation after harvest and follow with hoed crop. Hand-pull before seeds form in fence corners, etc.
Erect, bushy, flowers pale pink	Annual	Grain fields, etc.	Very bad in Manitoba and Northwest. Hoed crops, summer fallowing where very bad.

INSECTS INJURIOUS TO CROPS AND STOCK.

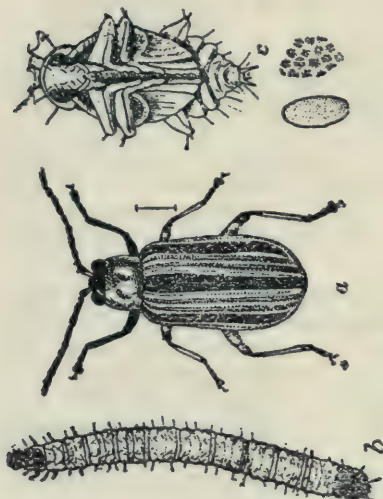


Fig. 1.

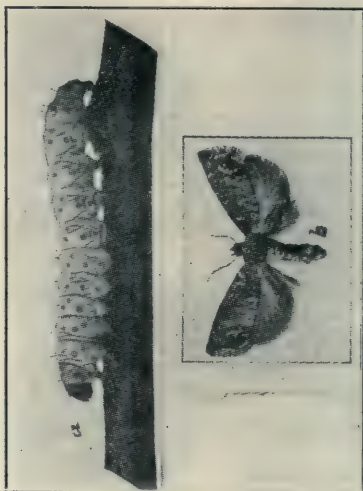


Fig. 2.



Fig. 3.

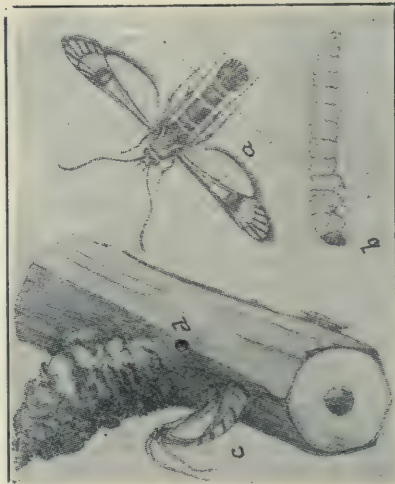


Fig. 4.

Fig. 1.—Striped cucumber beetle: (a) beetle; (b) grub; (c) pupa; (d) egg.

Fig. 2.—Codling worm (a); Codling moth (b), much enlarged.

Fig. 3.—Stable fly; a biting insect.

Fig. 4.—Currant Cane-borer: (a) Adult, a clear-winged moth; (b) Caterpillar boring in the pith; (c) Pupa protruding from hole; (d) Exit hole.

Injurious Insects

NAME	PLANT AFFECTED	PART AFFECTED	TREATMENT RECOM- MENDED
Common Clover Wee- v.....	Clover	Unripe seed	Cut early, rotate frequently, high fermentation in stack.
Bean-Seed Weevil.....	Bean and pea	Seed in gran- ary	Clean seed, pickling seed with blue vitriol and dilute carbolic acid.
Granary Weevil.....	Corn in gran- ary	Inside the grains	Frequent turning of grain winnow out and destroy the light, affected grains.
Turnip Weevil.....	Turnip, swede cabbage	Galls on the roots	Clean cultivation, liming, gas liming.
Wireworms, Click-Bee- tles of various kinds....	Corn and all crops	Roots just be- low the sur- face	Short rotation of crops- plowing in August and cross, plowing in September.
Tooth-legged Flea- Beetle, Hop Flea.....	Turnip, swede	Leaves	Thick sowing, keep down cruciferous weeds.
Bean Weevil.....	Bean, clover	Leaves	Fumigate after harvested, 1 oz. carbon bisulphide for every 100 lbs.
Corn Root Aphis.....	Corn	Roots	Thorough plowing, short rotation of crops, deep and clean cultivating.
Turnip Flea Beetle.....		Young Leaves	Sow late, dust with Paris green and land plaster 1 to 20, goodtilth.
Corn Saw-Fly.....	Corn	Stalks at ground	Destroy stubble by burning and also deep plowing.
Turnip Plant Louse....	Turnip, roots, etc.	Roots and crowns	Kerosene emulsion and strong soap suds. Cut out affected plants immediately
Carrot-Blossom Moth, and others.....	Carrot	Young seeds	Dusting hellebore on damp leaves, intersperse a portion of parsnips, which they pre- fer.

NAME	PLANT AFFECTED	PART AFFECTED	TREATMENT RECOMMENDED
Pea Weevil.....	Pea	Peas in pod	Harvest early; put in barrels and fumigate with carbon bisulphide. Rake up field and burn.
Otter Moth.....	Hop	Root	Examine roots and hand pick, keep down rubbish at side of field.
Cabbage Butterfly.....	Cabbage	Leaves	One lb. pyrethrum powder with four lbs. cheap flour. Dust with mixture about twenty four hours after mixing.
Cabbage Fly	Cabbage	Leaf	One lb. Paris green with 20 lbs. lime. Applp underside of leaves.
Mangold Fly.....	Mangold	Leaf	Good cultivation, liberal manuring, including salt and kainit, spray well.
Hessian Fly.....	Wheat, Barley	Inside leaf sheath	Late sowing in autumn, burning stubble, destroying screenings from threshing machine, deep plowing.
Wheat Midge, Red Maggot.....	Wheat	Ears	Burn stubble, deep plowing, destroy chaff and screenings.
Carrot Fly, "Rust"	Carrot	Root	Single as soon as plants can be handled, spray immediately after thinning out, fine soil.
Crane Fly, "Daddy Long Legs".....	Corn and grass	Root and underground stem	Drainage, autumn cultivation, stimulating manures
Black Slug.....	All crops	Leaves	Good cultivation and manuring, successive dressings of lime, salt, etc.
Red Spider.....	Fruit	Leaves	Spray leaves with strong wash, dress leaves with lime and soot in winter.

Potato Flea Beetle.....	Potato	Leaves	Spray with Bordeaux mixture with or without Paris green.
Tomato Worm.....	Tomato	Leaves	Dust with Paris Green and land plaster, one pound poison to twenty of plaster.
Colorado Potato Bug...	Potato	Leaves	Paris green or Arsenate of lead with Bordeaux mixture. Spray early June.
Onion Maggot.....	Onion	Leaves	Treat rows with whitewash, made of lime and water, to form a crust over surface.
Squash Bug.....	Melon and Cucumber	Leaves	Treatment chiefly preventive; spray with Bordeaux mixture.
White Grubs.....	Fruit	Leaves	Spray trees with Paris Green. Repeat every three years.
Grasshoppers.....	Vegetables of all kinds	Leaves	"Criddle mixture" sprayed on parts affected

HOW TO MAKE INSECTICIDES

Poisoned Bordeaux

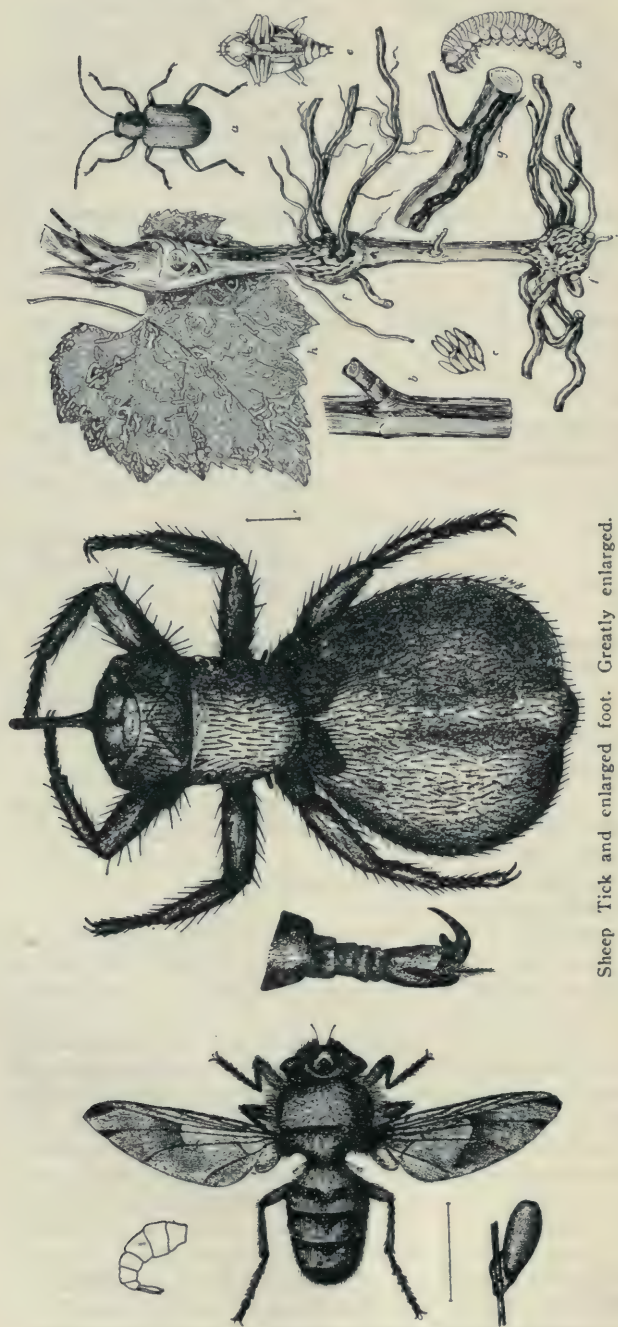
Four pounds of fresh lime, four pounds of bluestone, and four ounces of Paris green, thoroughly mixed in forty gallons of water. In all cases where spraying with Paris green is recommended it is advisable to add the bluestone (or Bordeaux mixture) in order to counteract the fungus diseases at the same time as the insects are destroyed. The bluestone (copper sulphate) should be dissolved by suspending it in a wooden vessel containing four or five gallons of water, and the lime slacked in another vessel; if lumpy, the lime should be strained through coarse sacking. Pour the bluestone solution into a barrel and half fill with water; dilute the slacked lime to half a barrel and mix the two together. The Paris green should be made into a paste with warm water, poured into the barrel and stirred thor-

oughly. The mixture is then ready for use. The addition of the lime prevents the poison from scorching the foliage.

Lead Arsenate

Arsenate of soda, 10 ounces; arsenate of lead, 24 ounces; water, 150-200 gallons. "The arsenate of soda, and the arsenate of lead (sugar of lead) should be dissolved separately and then poured into a tank containing the required amount of water. A white precipitate of lead arsenate is immediately formed, and when thoroughly stirred is ready for spraying. The preparation may be used several times stronger without the least danger of scorching the most delicate plants. When sprayed upon the foliage it forms a coating which adheres so firmly that it is but little affected by ordinary rains." (Bulletin 154, O.A.C.)

INSECTS INJURIOUS TO FARM CROPS AND STOCK.



Sheep Tick and enlarged foot. Greatly enlarged.

Horse Bot Fly, male; abdomen of female on left, egg on right; enlarged.

Illustration No. 1 shows the Horse Bot Fly Hatch four weeks after laid and are three-quarters of an inch long. They are licked into the mouth and attach themselves to the stomach wall and remain about ten months. Are found first on hair of forelegs. Keep horses well groomed.

Illustration No. 2 shows the Sheep Tick. Dip sheep after shearing.

Illustration No. 3 shows the Grape Root Worm : *a* Adult Worm ; *b* eggs on cane ; *c* eggs enlarged ; *d* full grown worm ; *f*, *g* and *h* showing root injury ; *h* grape leaf, showing injury to beetle.

Kerosene Emulsion

The following is the formula recommended by Dr. Fletcher, Central Experimental Farm, Ottawa (Bulletin No. 52).

Kerosene (coal oil) 2 gallons; rain water 1 gallon; soap $\frac{1}{2}$ pound.

Boil the soap in water till all is dissolved, then, while boiling hot, turn it into the kerosene and turn the mixture constantly and forcibly with a syringe or force pump for five minutes, when it will be of a smooth, creamy nature. If the emulsion is perfect, it will adhere to the surface of glass without oiliness. As it cools it thickens into a jelly mass. This gives the stock emulsion which must be diluted with nine times its measure of warm water before using on vegetation. The above quantity of three gallons of emulsion will make 30 gallons of wash. Kerosene emulsion may also be made conveniently by using an equal amount of sour milk instead of soap and water in the above formula, and churning for the same time to get the stock emulsion.

Another method is to use lime, which will hold the kerosene in suspension, or the following, where lime cannot be obtained. (From Bulletin 171, O.A.C.)

The requisite amount of kerosene is placed in a dry vessel and flour added in the proportion of 8 ounces to one quart of kerosene. It is then thoroughly stirred and two gallons of water added for every quart of kerosene; the whole is then vigorously churned for from two to four minutes, and the emulsion is ready for use. It has been found that by scalding the flour before adding the kerosene, an excellent emulsion which does not separate in the least after standing for a week, can be prepared with 2 ounces of flour, by mixing the resulting paste with one quart of kerosene and emulsifying with two gallons of water.

Tobacco Wash (for destroying Aphis)—

Soak 4 pounds of tobacco waste in 9 gallons of hot water for four or five hours

(in cold water for four or five days) dissolve one pound of whale-oil soap in one gallon of hot water; strain the decoction into the dissolved soap and apply with a spray pump as forcibly as possibly.

Soap Washes

Dissolve one pound of whale-oil soap in four gallons of warm water for black or brown Aphis, and one pound in six gallons for green Aphis.

Another remedy for Aphis is the following. Boil 8 pounds of quassia chips in 8 gallons of water for an hour, dissolve 7 pounds of whale-oil soap in hot water, strain the quassia decoction and mix with the soap solution, then dilute to make 100 gallons. Spray forcibly while hot, this will kill the plant-lice and not injure the plants.

Formalin

40% solution of formaldehyde in water.
1 pint of commercial to 45 gals. of water.
For fungus diseases.

Cook's Carbolic Soap Wash

Hard soap 1 pound, or soft soap 1 quart; crude carbolic acid 1 pint; water (boiling) 1 gallon.

Dissolve the soap in the boiling water, while still hot add the carbolic acid, emulsify thoroughly. This is the stock solution. For use, dilute with 30 to 50 times its bulk of water. Very effective against root-maggots of cabbage, radish and onion.

Hellebore

White hellebore (fresh) 1 ounce; water 2 gallons.

Pyrethrum, or Insect Powder

Pyrethrum powder (fresh) 1 ounce; water 3 gallons; of pyrethrum 1 ounce; flour (cheap) 5 ounces.

Mix thoroughly, allow to stand over night in a closed tin box, then dust on plants through cheese cloth.

NUMBER OF TREES TO AN ACRE

2 ft. apart each way.....	10,890	12 ft. apart each way.....	302
3 ft. apart each way.....	4,840	15 ft. apart each way.....	200
4 ft. apart each way.....	2,722	18 ft. apart each way.....	135
5 ft. apart each way.....	1,742	20 ft. apart each way.....	110
6 ft. apart each way.....	1,210	22 ft. apart each way.....	90
8 ft. apart each way.....	680	25 ft. apart each way.....	70
10 ft. apart each way.....	435	30 ft. apart each way.....	50

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LIVESTOCK

Feeds and Feeding.

A digest of the principles of breeding, feeding and caring for horses, cattle, sheep and swine, from the foremost authorities in Canada and elsewhere. Technical and scientific terms have been avoided where possible and explained when it has been necessary to make use of them.

Digestibility.

The ability of any animal to make proper use of the food supply is of great importance. Of two animals fed the same food, one will consistently digest more than the other. In young animals digestive power is as full as in the aged animal. Differences in the quantity of the daily ration of hay do not affect the proportion digested; an animal will not digest more after being starved. Labor does not increase materially the quantity of food digested. Difference in quality exercises a great influence, as also the addition of some other food.

The study of foods and feeding stuffs has shown that although they differ so much in texture and appearance they are in reality made up of a small number of chemical constituents, namely, protein, fat, carbohydrates, and ash, together with a larger or smaller amount of water. The latter can often be seen, as in the juice of fresh plants. In dry foods, such as hay, no water is visible. A small amount is, however, always present in minute particles in all plant tissues.

Protein is a name given to the total group of nitrogenous materials present. The group is made up mainly of the true protoids and albumens. The best-known examples of these substances are such materials as the gluten of wheat, lean meat, the white of an egg, etc. This group also includes other nitrogenous substances called amides, which are believed to

have a lower feeding value than the true protoids.

The group "fat" includes the true vegetable fats and oil, like the oil in flaxseed and corn, as well as vegetable wax and a few other materials which are extracted by ether or gasoline in the usual laboratory method of estimating fat. The name "ether extract" is often, and quite properly, applied to this group.

The group, "carbohydrates" includes starches, sugars, cellulose, and other bodies of a similar chemical structure.

The group, "mineral matter" includes salts present in the juices and tissues of feeding stuffs. These substances are principally sodium, potassium, lime, phosphorus and sulphur. The term "ash" is often, and very appropriately, used in speaking of this group, as the mineral matter represents the incombustible portion which remains when the feeding stuff is burned.

The functions of food are: (1) to supply material to build and repair the body, and (2) to yield energy. The chemical composition of a feeding stuff serves as a basis for judging of its value for building and repairing body tissue. Its value as a source of energy must, however, be learned in another way. The most in terms of heat, the caloric being used method of measuring method is taken as the unit. A caloric represents the amount of heat sufficient to raise the temperature of one kilogram of water one degree on the centigrade scale, or the temperature of one pound of water four degrees Fahrenheit.

The fuel value of a ration fed to any animal may be calculated from the composition of the food material supplied, on the assumption that 1

pound of protein equals 1,860 calories, 1 pound of fat 4,220 calories, and 1 pound of carbohydrates 1,860 calories.

Nutritive Ratio.

The relation existing between the nitrogenous and nitrogen-free nutrients in the ration is termed the nutritive, or nutrient ratio. In calculating this ratio it is necessary to arrive at a factor which will represent the total value of the fat and the carbohydrates. As will be seen by reference to the preceding values for the production of energy, fat has a value which is 2.25 times as great as an equal weight of carbohydrates. So that the nutritive ratio is actually the relationship existing between the protein in the ration and a factor obtained by multiplying the fat by 2.25 and adding to the carbohydrates. The nutritive ratio may be concisely stated as follows: Protein (fat x 2.25 plus carbohydrates.)

As has been stated, one of the chief functions of food was to supply material to build and repair the body. The different constituents of which feeding stuffs are composed differ in their ability to serve this purpose. All the organs and tissues of the body contain nitrogen. Protein is the only nutrient which supplies this element, and is therefore essential in building up and restoring body tissues. It is plain, therefore, that the demands of the animal for material with which to renew the tissues of the body and to provide for growth of the different parts, must be satisfied by the protein contained in the ration.

Heat and Energy.

The heat and energy which is required in the animal body may be supplied by any one of the three constituents—protein, fat or carbohydrates. If the cost of raising or procuring protein was about the same as it is for carbohydrates, it would be of little importance to do more than assure a sufficient supply of this

ingredient. If the ration contained decidedly more protein than was necessary, the feeder would not be incurring any loss, for this substance is able to supply all of the requirements of the body which may be supplied by carbohydrates or fats. But at the present time protein is very considerably dearer than carbohydrates. Foods rich in protein always command the highest prices. It is essential, therefore, to be as economical as possible in the use of this nutrient, and to limit the quantity as far as practicable. It thus becomes necessary to find what this limit is for the different species of animals, and for the different conditions under which they may be kept. Large numbers of feeding experiments have been made under varying conditions with this end in view. From the results, feeding standards have been worked out, which show the amount of digestible protein, fat, and carbohydrates supposed to be best adapted to different animals when kept for different purposes.

Since certain of the nutrients can replace one another, it often transpires that the physiological standard does not correspond with the standard for most economical production in a given locality. This applies more especially to the protein, which is the most expensive nutrient; but, as a matter of fact, it has often been found in practical experience, that production has been increased and cheapened by making the rations conform more nearly to those suggested by the physiological standard.

To Balance a Ration.

After reading the paragraph on "Nutritive Ratio," and with a definite understanding of the value of such take an inventory of the feeds at your disposal and then read the paragraph in this chapter on "Selection of Feeding Stuffs." Now say that you wish to balance a ration for a steer. In the table on feeding standards we find the total dry matter to be about 30 lbs., protein 2.5 lbs., carbohydrates 15.0 lbs., fat 5 lbs. Now turn to your feeding and computation table and

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proceed down the first column and, finding the feeds there similar to those possessed by you, figure out your balanced ration, not forgetting that variety is one of the greatest appetizers and aids to digestion in the business.

Wolff's Standards.

The feeding standards prepared by Wolff, a German investigator in animal nutrition, have been the most widely used of any. These were based largely on the weight of the animal, although an attempt was made to make allowance for the age of the animal and for the kind of work performed. Of late, however, there has been quite a general belief that the standards should take more account of the amount or character of production. In the case of milch cows, for example, it is thought that the standard should be adapted to the amount of milk produced, making the

live weight a matter of secondary consideration. The most important use of protein in feeding cows is in the formation of milk. Hence a cow producing 20 quarts of milk per day will require considerably more protein to elaborate this milk than one giving only eight quarts; and as the milk production of cows bears no particular relation to the live weight, a hundred pounds in weight more or less need make very little difference in the ration. The use of rations varying in accordance with the milk production is comparatively simple, as it only requires that the weight of milk given by the different cows be known. Wolff's standards have recently been modified by Prof. F. Lehmann, as the result of additional experiments and practical experience, and also in the attempt to adapt them more closely to the practical needs of the animal.

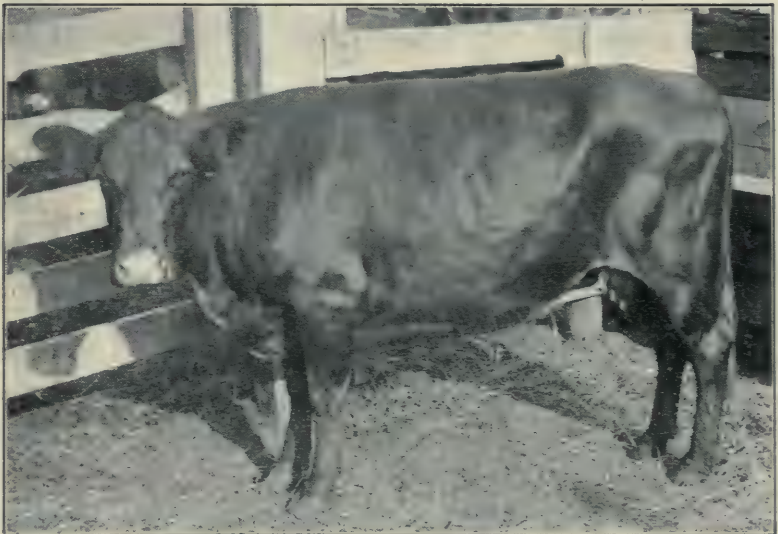
Wolfe-Lehman Feeding Standards

Showing amounts of nutrients per 1,000 lbs. live weight for one day's feeding

Animal	Total Dry Matter	Digestible Nutrients			Fuel Value
		Protein	Carbo Hydrates	Fat	
	Pounds	Pounds	Pounds	Pounds	Pounds
Fattening Cattle—					
First period.....	30	2.5	15.0	0.5	34,650
Second period.....	30	3.	14.5	0.7	35,500
Third period.....	26	2.6	15.0	0.7	35,900
Milch Cows—					
Giving 11 pounds milk a day.....	25	1.6	10.0	0.3	22,850
Giving 16½ pounds milk a day.....	27	2.0	11.0	0.4	25,850
Giving 22 pounds milk a day.....	29	2.5	13.0	0.8	33,700
Giving 27½ pounds milk a day.....	32	3.3	13.0	0.8	33,700
Sheep—					
Coarse wool.....	20	1.2	10.5	0.2	22,600
Fine wool.....	23	1.5	12.0	0.3	26,400
Breeding Ewes with Lambs.....	25	2.9	15.0	0.5	35,400
Fattening Sheep—					
First period.....	30	3.0	15.0	0.5	35,600
Second Period.....	28	3.5	14.5	0.6	36,000
Horses—					
Light work.....	20	1.5	9.5	0.4	22,150
Medium work.....	24	2.0	11.0	0.6	26,700
Heavy work.....	26	2.5	13.3	0.8	32,750



CHOICE BUTCHERS' COW.



GOOD BUTCHERS' COW.

Types of Market Cattle

Wolfe-Lehman Feeding Standards

Animal	Total Dry Matter	Digestible Nutriments			Fuel Value
		Protein	Carbo Hydrates	Fat	
	Pounds	Pounds	Pounds	Pounds	Pounds
Brood sows.....	22	2.5	15.5	0.4	35,170
Fattening swine—					
First period.....	36	4.5	25.0	0.7	57,800
Second period.....	32	4.0	24.0	0.5	54,200
Third period.....	25	2.7	18.0	0.4	40,200
Growing Cattle—					
Dairy Breeds—					
2 to 3 months old, weighing about 150 pounds.....	23	4.0	13.0	2.0	40,050
3 to 6 months' old, weighing about 300 pounds.....	24	3.0	12.8	1.0	33,600
6 to 12 months' old, weighing about 500 pounds.....	27	2.0	12.5	0.5	29,100
12 to 18 months' old, weighing about 700 pounds.....	26	1.8	12.5	0.4	28,300
18 to 24 months' old, weighing about 900 pounds.....	26	1.5	12.0	0.3	26,350
Beef Breeds—					
2 to 3 months' old, weighing about 160 pounds.....	23	4.2	13.0	2.0	40,450
3 to 6 months' old, weighing about 330 pounds.....	24	3.5	12.8	1.5	36,650
6 to 12 months' old, weighing about 550 pounds.....	25	2.5	13.2	0.7	32,150
12 to 18 months' old, weighing about 750 pounds.....	24	2.0	12.5	0.5	29,100
18 to 24 months' old, weighing about 950 pounds.....	24	1.8	12.0	0.4	27,350
Growing Sheep:					
Wool Breeds—					
4 to 6 months' old, weighing about 60 pounds.....	25	3.4	15.4	0.7	37,900
6 to 8 months' old, weighing about 75 pounds.....	25	2.8	13.8	0.6	33,400
8 to 11 months' old, weighing about 80 pounds.....	23	2.1	11.5	0.5	27,400
11 to 15 months' old, weighing about 90 pounds.....	22	1.8	11.2	0.4	25,850
15 to 20 months' old, weighing about 100 pounds.....	22	1.5	10.8	0.3	24,150
Mutton Breeds—					
4 to 6 months' old, weighing about 60 pounds.....	26	4.4	15.5	0.9	40,800
6 to 8 months' old, weighing about 80 pounds.....	26	3.5	15.0	0.7	37,350
8 to 11 months' old, weighing about 100 pounds.....	24	3.0	14.3	0.5	34,300
11 to 15 months' old, weighing about 120 pounds.....	23	2.2	12.6	0.5	29,650
15 to 20 months' old, weighing about 150 pounds.....	22	2.0	12.0	0.4	27,750
Growing swine:					
Breeding stock—					
2 to 3 months' old, weighing about					

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all railroads.

50 pounds.....	44	7.6	28.0	1.0	70,450
3 to 5 months' old, weighing about 100 pounds.....	35	5.0	23.1	0.8	55,650
5 to 6 months' old, weighing about 120 pounds.....	32	3.7	21.3	0.4	48,190
6 to 8 months' old, weighing about 200 pounds.....	28	2.8	18.7	0.3	41,250
8 to 12 months' old, weighing about 250 pounds.....	25	2.1	15.3	0.2	33,200
Growing Fattening Swine—					
2 to 3 months' old, weighing about 50 lbs.....	44	7.6	28.0	1.0	70,450
3 to 5 months' old, weighing about 100 lbs.....	35	5.0	23.1	0.8	55,650
5 to 6 months' old, weighing about 150 lbs.....	33	4.3	22.3	0.6	52,000
6 to 8 months' old, weighing about 200 lbs.....	30	3.6	20.5	0.4	46,500
9 to 12 months' old, weighing about 275 lbs.....	26	3.0	18.3	0.3	40,900

QUANTITY AND QUALITY.

In addition to furnishing the requisite amount of nutrients, the food must have a certain bulk. The required bulk is secured by feeding a certain amount of coarse fodder, which aids digestion and helps to keep the animal satisfied and healthy.

The measure of the bulk or total solid matter is the weight of dry matter in the ration. The dry matter is the solid or water-free portion of the food. More latitude is allowable in this than in the case of any single nutrient.

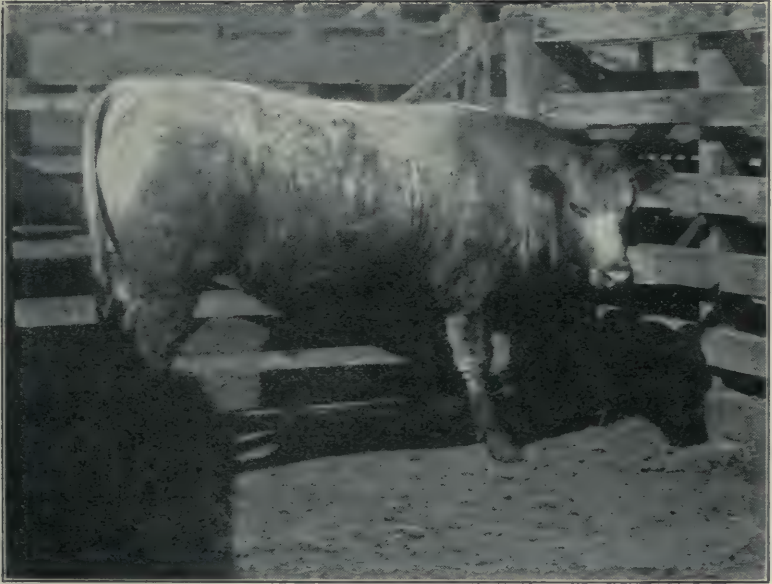
FEEDING STANDARD VALUE.

It should be borne in mind that feeding standards are simply a concise and approximate statement of the amounts of the different nutrients required by animals, as indicated by the results of experiments and observation. They are not to be regarded as infallible or as absolute formulas which can be followed blindly without regard to the conditions. They are intended to apply to the average conditions. No single standard can be laid down for all conditions. Good judgment and intelligent observation on the part of the feeder are necessary in the application of feeding standards as the calculation of economical rations is not merely a matter of applied mathematics. The local conditions, as regards the feeding stuffs which can be grown and purchased economically, and the value of the products, will have much to do in determining how closely the

feeder can afford to adhere to the standard. But such standards or formulas, used in connection with the feeder's observation of his animals and the markets, are very useful, and have served a good purpose in improving the practice of feeding. It is in their abuse that the chief danger lies.

Ration and Yield.

In making allowance for the difference in milk yield in different cows, a uniform basal ration may be fed to all the cows, and the amount of the richer grain food varied to suit the demands. Such feeds as roughage and the less concentrated grain foods may be fed uniformly to all the animals. To the allowance of these feeds could be added a quantity of some such feed as gluten meal, linseed oilcake meal or cottonseed meal, the amount being varied to suit the milk yield of the cow.



CHOICE STEER.



CHOICE HEIFER.

Types of Market Cattle

Selection of Feeding Stuffs.

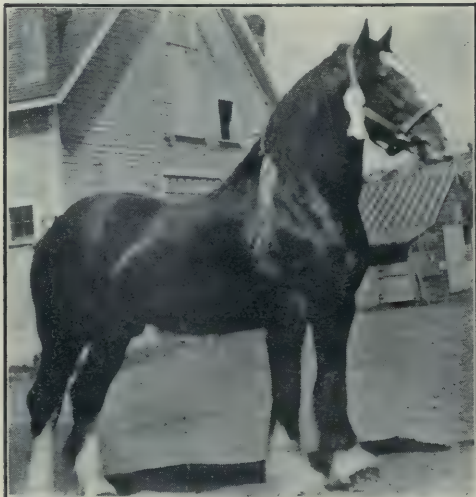
In selecting feeding stuffs for his stock, the farmer will naturally be governed by the condition of the market. The cost of feeding stuffs is controlled by other factors than the actual amounts of food materials which they contain; indeed, there often appears to be very little connection between the two. Bearing in mind that the protein is the most expensive ingredient, and the one especially sought in concentrated feeds, the farmer can make his selection with the aid of the tables showing the digestive materials in 100 pounds. This will show him whether feed wheat at 70 cents a bushel is as cheap as corn at 60 cents, and how gluten feed at \$25 per ton will compare with linseed meal at \$30.

Stock Foods.

A considerable number of proprietary articles, sold under trade names, are found on the markets of this country. Judging from the extent to which they are advertised and sta-

tistics which have been collected from feeders, the employment of prepared or condimental feeds must be quite extensive. Extravagant claims are made for them as to their effect upon the general health of animals, and their feeding value, or their ability to increase the feeding value of other foods fed in conjunction with them. They frequently contain a considerable quantity of salt, some fenugreek, aromatic seeds, charcoal, Epsom salts, sulphur, cayenne pepper, gentian, ginger, etc.

Analysis of samples of these feeding stuffs collected from time to time show that none of them can be regarded as concentrated feeds in the common acceptance of the term. The basis of the best of them is linseed or flaxseed meal, or some cereal by-product. They are usually sold at exorbitant prices, ranging from 10 to 20 cents a pound. Neither the claims made for their valuable properties, nor the need of supplying tonics or medicines with the food, will justify the feeder in buying such materials.



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Beef Feeding Rations.

Mix a few hours before feeding: Ensilage, 40 lbs.; cut straw, 4-5 lbs.; roots, 15 lbs.; long clover, 4 lbs.

The grains are fed as follows:

First and second weeks, none.

Third week, 1 lb. of bran.

4th week, 2 lbs. chiefly bran.

Fifth and sixth weeks, 3 lbs. consisting of bran 2 parts; oil cake and gluten meal, 1 part by weight.

Seventh, eighth and ninth weeks, 4 lbs. of mixture in equal parts.

Tenth, eleventh and twelfth weeks, 5 lbs. above mixture; bran, 1 part; oil cake or gluten meal, 2 parts.

Another method which is very successful: House cattle about middle of November; begin feeding immediately a mixture of 25 lbs. silage, 6 to 7 lbs. cut straw, 1½ lbs. chop. Mix in morning and add a little salt. Increase the meal ration gradually up to 8 or 9 lbs.

The preceding systems are for cattle finished for the winter and spring trade. Cattle to be finished en grais are fed in practically the same manner in so far as the rough food is concerned. The grain ration, however, seldom goes above 3 lbs. per day.

Buying Feeds.

As a rule never pay more than \$6.00 per ton for hay for feeding. Grains are a good buy at \$1.00. Gluten meal and oil cake are profitable.

Roots Versus Ensilage.

Corn is a surer crop and gives more feed per acre than any other crop grown. It requires little labor. Some feeders, however, prefer

feeding both, as cattle do not go wrong so easily. Roots have a peculiar cleansing effect upon the digestive system.

Roots tend to correct any slight derangement that has been caused by other foods. Roots are especially valuable for young stock, whereas ensilage should only be fed in very limited quantities to animals under one year of age.

Water.

Where an abundance of roots is fed very little water is needed. Six pecks of turnips contain about 80 lbs. of fluid. Water should be available at all times.

Sheep and Feeding Rations.

Select ewes with good, firm bone and short, strong pasterns, fair size of feet, legs straight and squarely set under. Heavy shearers most possible; density of fibre and length of staple must be considered. Have flock uniform. Select ram of medium size; must possess good qualities of conformation and wool with strong masculinity, bold carriage and strong bone. He must be pure bred.

Fifteen ewes is the minimum on one hundred acres, and not beyond twenty-five. An increase through lambs can be expected of from 150% to 175%.

Buy ewes in Autumn just after lambs have been weaned. Two shear ewes are to be preferred, as you will know whether they are breeders or not.

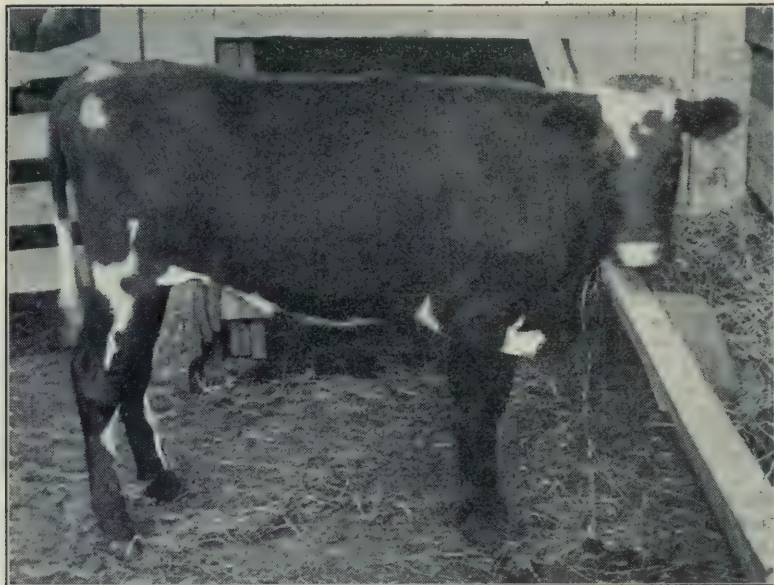
Strongest lambs are sired by rams one year and over. Fifteen ewes are enough for one ram. If more are in the flock, the ram should not be allowed to run with them.

Feeds.

Ewes should have a run on stubble fields—not sown to clover, or old pastures under middle of September, and then given access to rape or clover field. If this is not available feed a small quantity of grain to make sure ewes are thriving well when breeding. This is the secret of large percentage of turn lambs.

Wintering.

Have flock in good flesh when winter sets in. Can be kept doing well on clover hay, a few roots—about 3 lbs. per head per day, and a liberal feed of pea straw. Feed one pound per head each day of mixed oats and bran, about four weeks before lambing. Double grain feed after lambing, and also the mangels and turnips to all that can eat. Roots are too bulky and cold to feed heavily before lambing and affect the unborn lamb. Turnips before lambing and mangels after. Never feed mangels to rams.



MEDIUM HEIFER.



COMMON ROUGH STEER.

TABLE OF BREED CHARACTERS

BREED	Colors Found	Favorite Color	Hair	Horns	Size	Special Utility Value
SHORT-HORN	Red, white, red and white, roan	Roan	Fine and fairly short	Horns short, fine incurving, straighter in bulls	Will average largest of beef breeds	Crossing for size and quality
HEREFORD	Light to dark red, bald face, some white at withers	Middle red with white face	Fairly long and fine	Horns long and wide, nearly level	Large	Crossing for size and fattening, and grazing quality
ABERDEEN-ANGUS	Black, sometimes a reddish tinge, white on underline back of navel	Black with as little white as possible	Short and fine	Sharp poll	Very compact and weigh well but hardly as large as Short-horns	Smoothness, compactness, and thick fleshing
GALLOWAY	Black, with an occasional reddish or brownish tinge	Black, white a disqualification	Long and curly	Round poll	Hardly as large as three preceding breeds	For hardness and value of skins
DEVON	Light and dark red	Bright red	Short and fine	Long and spreading	Not as large as Galloway	For draft purposes
POLLED DURHAM	Short-horn color	Roan	Short and fine	Round poll	Not as large as Short-horn	Polled character
RED POLLED	Light to dark red, and little white	Solid red	Fine	Sharp poll	Medium Size	Dual purpose
WEST HIGHLAND	Yellow, red, black, brindle, some white	Solid color	Long and shaggy	Long and outturning upwards	Small	For rough, spare pasture land in cold climate
SUSSEX	Solid red	Dark	Thick	Large, long and level	Almost as large as Herefords	Range in temperate climate

Hog Feeding.

The following rations for hogs are not given as absolute, but will give an idea of a fairly well balanced ration of common feeds giving good practical results:

Growing Ration.
Corn Meal.
Ground Oats.
Wheat Middlings.
Oil Meal.
Salt.

Brood Sow Ration.

Regular Milking Hours.

Result of Dominion Department of Agriculture experiments resulted as follows:

	Average daily yield.	Average per cent. per cow per day.	Average weight of fat per cow daily.
Irregular	26.7	3.96	0.9937

Feed Ratios.

Stating relation which should exist between carbohydrate and proteins.

	Dry Matter.	Protein.	Carbohydrates.	Ratio.
Ox	17.5	.7	8.15	1 to 12
Horse	22.5	1.8	11.8	1 to 7
Milch Cow ...	24	2.5	12.9	1 to 54
Pigs	42	7.5	30	1 to 4

Feeds For Pigs.

Sow on milk, skim milk and wheat, middlings, barley, oats or corn.

Proteins feeds for pigs: Gluten meal, buckwheat, middlings, brewer's grains and peas.

Carbohydrate feeds: Oats, barley, wheat and corn.

Forage crops: Clover, alfalfa, rape, sorghum and rye.

Contagious Abortion.

The Vermont Experiment Station has tested the use of Methylene Blue as a cure or preventive of contagious abortion.

"On June 13, 1913, about 8½ months from the beginning of the experiment 92 cows in all stages of pregnancy had been treated. Only one of these animals up to the month of June last has aborted, whilst 56 have calved at full time and 35 are yet to calve."

Methylene Blue can be bought at all drug stores.

Method.

Administer ⅓ to ½ oz. (10-15 grams) night and morning for seven days, beginning early in pregnancy and after a four weeks interval continue the treatment for another seven days and continue at four week intervals during the period of gestation.

Cost.

The approximate cost is \$2.50 per pound. Each gram costs about half a cent, making the daily dosage cost about 10c, and each week's treatment 70c per cow. Material can easily be purchased of wholesale druggists.

Note.—Can either be fed in capsules or on the feed. It is a powerful antiseptic.

Thoroughly disinfect the stables with mercuric chloride or some other reliable germicide. Use mercuric chloride in proportions of 1 to 1,000 of water.

A 1 to 1,000 lysol solution kills the germ in from 3 to 5 minutes. A distinct blue will be noted in the urine from two to six hours after the dose. Small amounts color urine green. Best way to administer is by the use of capsule in balling gum. Better treat the whole herd or that part of the herd which is pregnant.

Increase in Feed.

Prof. G. E. Day, O. A. C., Guelph, showed in experiments that the quantity of feed consumed per 100 lbs. increase in hogs increases rapidly with the weight.

Increasing from 54 lbs. to 82 lbs.

pigs required 3.10 lbs. of meal per lb. gain. Increasing from 82 to 115 lbs. shotes required 3.75 lbs. of meal per lb. gain. Increasing from 115 to 148 lbs. hogs required 4.38 lbs. meal per lb. gain. Increasing from 148 lbs. to 170 lbs. hogs required 4.55 lbs. of meal per lb. gain.

AGE AND WEIGHT OF STEERS SLAUGHTERED AT SMITHFIELD, ENG.

CLASS	Age in Days	Average Daily Gain	Live Weight at Slaughter	Dressing Per Cent.
Short-horn, 1 year old.....	642	2.11	1355	66.13
2 year old.....	963	1.92	1842	67.48
3 year old.....	1321	1.7	2251	69.38
Hereford, 1 year old.....	663	1.97	13.8	65.08
2 year old.....	1020	1.78	1817	67.15
3 year old.....	1349	1.64	2218	69.18
Devon, 1 year old.....	634	1.75	1112	66.01
2 year old.....	1045	1.51	1583	67.73
3 year old.....	1311	1.37	1796	67.32
Aberdeen-Angus, 1 year old.....	668	2.04	1366	65.37
2 year old.....	1008	1.74	1765	66.67
3 year old.....	1346	1.59	2138	67.39
Sussex, 1 year old.....	677	2.15	1452	65.42
2 year old.....	989	1.86	1837	68.18
3 year old.....	1285	1.61	2064	67.98
Red Polled, 2 year old.....	1002	1.64	1631	65.73
3 year old.....	1362	1.49	2022	65.77
Galloway, 2 year old.....	1027	1.64	1688	64.45
3 year old.....	1344	1.47	1969	64.84

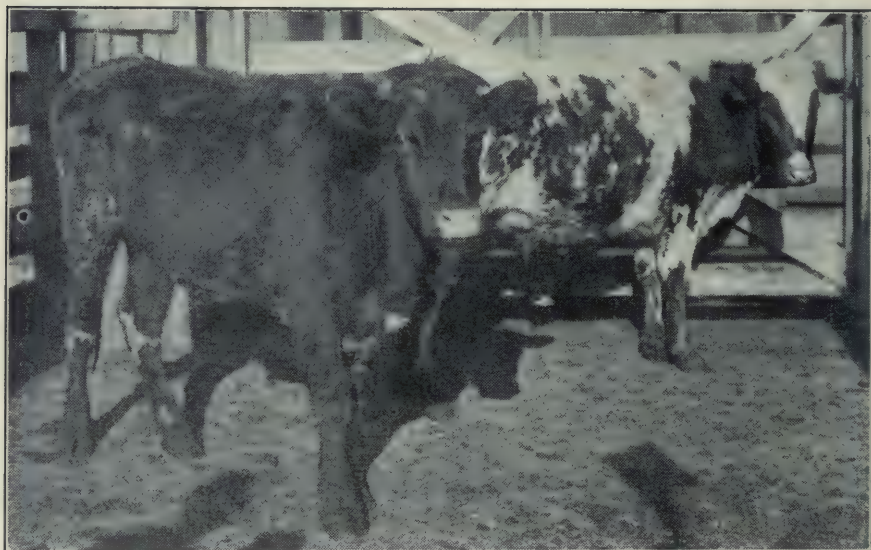
TABLE I. GRADING-UP A SCRUB HERD

Disappearance of unimproved blood by the continuous use of pure bred sires on succeeding generations.

Generations	Sires	Dams	Offspring	
	Per cent. purity	Per cent. purity	Per cent. purity	Per cent. unimproved blood
1.....	100	0	50 (½)	50 (1-3)
2.....	100	50	75 (¾)	25 (¼)
3.....	100	75	87.5 (7-8)	12.5 (1-8)
4.....	100	87.5	93.75 (15-16)	6.25 (1-16)
5.....	100	93.75	96.87 (31-32)	3.12 (1-32)
6.....	100	96.87	98.44 (60-64)	1.5 (1-64)



MEDIUM FEEDERS.



COMMON FEEDERS.

Ground and Unground Feed

Opinions differ as regards the advantages of grinding grain. For horses which are subjected to long hours of work, it is generally believed that all grains should be ground, and for those at extremely hard work the grain may be ground and mixed with chaffed hay. If the horses have comparatively long periods in which to consume their feed, no advantage is to be obtained by this practice. In other words, provided the animals have time to masticate their ration thoroughly, grinding is not necessary. When this is not the case, grinding takes the place of mastication to some extent, and increases the digestibility of the ration.

When whole oats were compared to ground wheat and brain at the North Dakota Station, the horses eating the former ration ate somewhat more and showed a slight loss in weight, while doing a little less work than those fed the ground grain. At the Utah Station, tests of the comparative

merits of ground and unground corn, oats and wheat, fed under experimental conditions, indicated that the ground and unground grains were equally satisfactory. When whole and ground oats, corn and barley were compared for feeding colts at the Iowa Station, somewhat larger gains were made on the ground feed.

The comparative digestibility of different ground and unground feeding stuffs was tested at the Maryland Station. It appeared from these tests that ground corn and oats were more thoroughly digested than the unground grain. In this connection it may be noted that similar results have been obtained with other farm animals, but it is commonly believed that the difference is often not sufficient to pay for the cost of grinding.

From all American tests, and those which have been made in Europe, it appears fair to say that there is no very marked advantage in grinding grain for healthy horses with good teeth.

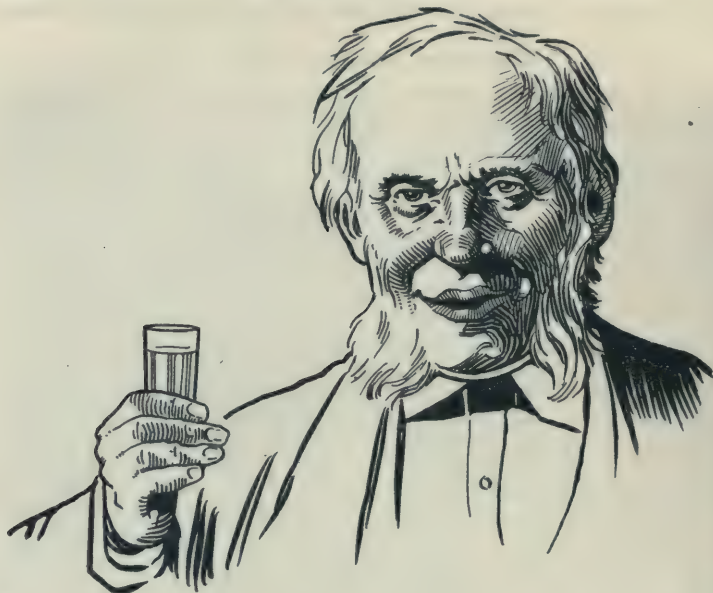
As will be seen, the average for the protein and energy in the rations of the horses performing light work are considerably less than similar values for horses performing moderate work. The rations for the truck and draft horses performing severe muscular work furnished less protein and energy on an average than the rations of the horses with moderate work. This is not in accord with commonly accepted theories, for it is generally conceded that horses at severe work require larger rations than those at moderate work. The discrepancy may be explained in part perhaps by the fact that the data for

the group performing severe work is much less extended than that for the group performing moderate work. There is every reason to suppose that the truck and draft horses received rations sufficient for their needs, as the firms owning them are known to make an effort to maintain their horses in good condition. Such truck and draft horses are often employed at work which is performed at a slow pace, and undoubtedly this has a bearing on the fact that they were able to perform a large amount of work on a comparatively small ration, as the speed at which the work is performed has a marked effect upon the food requirements.

Water

It is generally held, at least in practice, that any water that stock can be induced to drink is sufficiently pure for their use. This practice

occasions losses that would startle us if statistics were at hand. Water that is impure from the presence of decomposing organic matter, such as is



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found in wells and ponds in close proximity to manure heaps and cess-pools, is frequently the cause of diarrhoea, dysentery, and many other diseases of stock, while the water that is impregnated with different poisons and contaminated with specific media of contagion produces death in very many instances.

Considering, first, the quantity of water required by the horse, it may be stated that when our animals have access to water continually, they never drink to excess. Were the horse subjected to ship voyages or any other circumstances where he must depend upon his attendant for the supply of water, it may be roughly stated that each horse requires a daily average of about eight gallons of water. This will vary somewhat upon the character of his food; if upon green food, less water will be needed than when fed upon dry hay and grain.

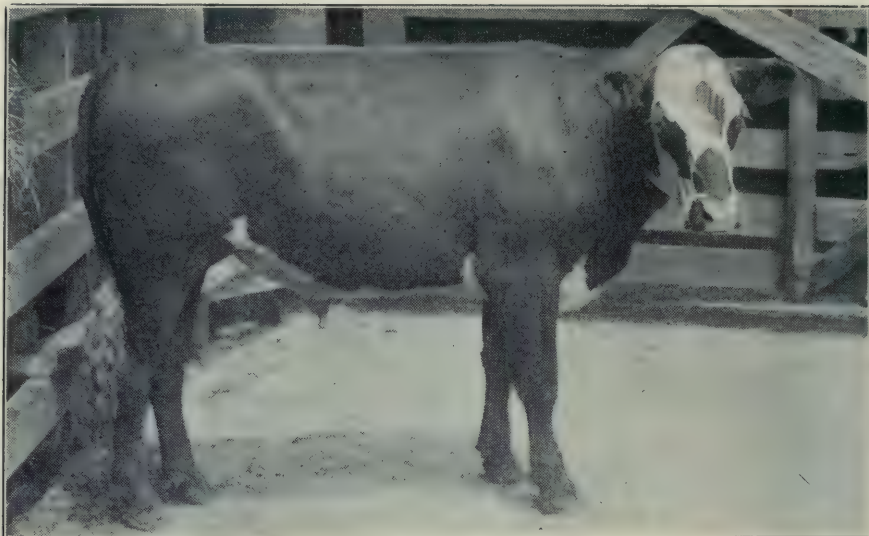
The time of giving water should be carefully studied. At rest, the horse should receive water at least three times a day; when at work, more frequently. The rule should be to give in small quantities and often. There is a popular fallacy that if a horse is warm he should not be allowed to drink, many claiming that the first swallow of water "founders" the animal, or produces colic. This is erroneous. No matter how warm a horse may be, it is always entirely safe to allow him from six to ten swallows of water. If this is given on going into the stable, he should be given at once a pound or two of hay, and, if much overheated or fatigued, allowed to rest about an hour before further feeding. If water be now offered him it will in many cases be refused, or at least he will drink but sparingly. The danger, then, is not in the "first swallow" of water, but is due to the excessive quantity that the animal will take when warm if he is not restrained.

Water should never be given to

horses when it is ice-cold. It may not be necessary to add hot water, but care should be taken that water intended for horses is not exposed for too long in troughs, etc., in extremely cold weather. Water freshly drawn from the well is not likely to cause harm. The danger from drinking cold water is materially lessened if the horse has not been deprived for a too great length of time.

In reference to the purity of water, Smith, in his "Veterinary Hygiene," classes spring water, deep-well water and upland surface water as wholesome; stored rainwater and surface water from cultivated land, as suspicious; river water to which sewage gains access, and shallow-well water as dangerous. The water that is used for drinking purposes for stock so largely throughout some districts cannot but be impure. I refer to those sections where there is an impervious clay subsoil. It is the custom to scoop, or hollow out, a large basin in the pastures. During rains these basins become filled with water. The clay subsoil being almost impervious, acts as a jug, and there is no escape for the water except by evaporation. Such water is stagnant, but would be kept comparatively fresh by subsequent rains were it not for the fact that much organic matter is carried into it by surface drainage during each succeeding storm. This organic matter soon undergoes decomposition, and, as a result, we find diseases of different kinds much more prevalent where this water is drunk than where the water supply is wholesome. Again, it must not be lost sight of that stagnant surface water is much more certainly conducive to disease in one animal of the herd, thus tainted than is running water by endangering the remainder.

About the only examination of water that can be made by the average stock raiser is to observe its taste, color, smell and clearness. Pure water is clear, and is without taste or smell.



CHOICE FEEDER.



GOOD STOCK HEIFER.

Types of Market Cattle.

Pulse, Respiration and Temperature of Farm Animals

The pulse is a dilation of the elastic wall of an artery at the moment of the heartbeat. Its character is some indication of the state of health. It is felt in the horse on the lower jawbone; in the ox, on the jaw, the inside of the elbow and cannon, and at the base of the tail. The number of beats of the pulse per minute will vary to a considerable extent in the normal animal. It is slower in the male than in the female, and is more rapid in the young than in the old.

Respiration is the act of taking in, and giving out of air by the lungs. The number of respirations per minute will vary considerably under dif-

ferent conditions. Muscular exercise will cause a rapid increase. In certain diseases the respiration is abnormally reduced; in others, an increase is the result.

The normal temperature of an animal is remarkably constant under varying conditions, and any considerable departure from the normal is of considerable value as indicating the animal's health.

The accompanying table gives the number of pulsations, the frequency of the act of respiration and the internal temperature of normal animals when at rest:

ANIMALS WHEN AT REST

Animal	Pulse, per minute	Respiration per minute	Temperature Fahr
Horse.....	36 to 40	8 to 10	100°
Ox.....	40 to 45	12 to 15	101° to 102.5°
Sheep.....	70 to 80	12 to 20	103°
Swine.....	70 to 80	10 to 15	103°
Dog.....	90 to 100	15 to 20	102.5° (very changeable)

Definition of Terms Ordinarily Met with in Breeding

Pure-Bred and Thoroughbred.—These two terms are too frequently used as if their meanings were the same. The term Thoroughbred is only correctly applied to the breed of English running horses known by that name. Pure-bred is a term applied to animals of such breeding as will entitle them to be admitted for registration in the records established for the particular breed to which they belong. The standards for admission to the records of the various breeds differ, so that a uniform definition of what would be accepted as pure-bred cannot be given.

Pedigree.—As spoken of in connection with animals, means a certified list of ancestors issued by a recognized institution, where such ancestry is recorded, or registered.

Literally speaking, all animals possess a pedigree, for all animals possess ancestors. The value of a

pedigree does not lie in the mere fact of its possession, but in the information which it furnishes with regard to the ancestors of the individual animal under consideration. The ancestry recorded on the pedigree may have been of great individual excellence or otherwise, and it is of great importance that the breeder be in possession of this information when forming an estimate of the value of an animal.

Line-Breeding.—By this term is meant the mating together, for successive generations, of animals of a common line of descent; or, to express the same idea in other words, to restrict the selection of animals for mating to the members of a single family or strain. The purpose of such a system of breeding is to concentrate the characters possessed by a certain family as far as possible, and to develop the best that may be

[illegible]

derived from any one particular strain.

Inbreeding.—Line-breeding involves the breeding together of closely related individuals. When this practice is carried to its limits, and involves the breeding together of sire and offspring, or of dam and offspring, or of brother and sister, it becomes "inbreeding," or "breeding in and in." It has the same purpose as line breeding, with rather greater dangers, for it is line breeding carried to the extreme.

Heredity.—This term refers to the extent to which the character of the parents and of their ancestors is

transmitted to the progeny. No question is of greater importance to breeders, and no subject related to breeding has been given more consideration. It has been stated as a law that "like produces like, or the likeness of some ancestor." The influence of ancestors distantly removed is too often overestimated. Frequently too much stress is laid upon the "foundation stock," and not sufficient attention is given to those from which the animal is more directly descended. A reference to the following table will illustrate clearly that it is the top rather than the bottom of the pedigree which should be most considered.

Generation backward	Effective contribution of each generation	Number of ancestors involved	Effective contribution of each ancestor
1.....	1.2	2	1.4 or 25 p.c.
2.....	1.4	4	1.16 or 6.25 p.c.
3.....	1.8	8	1.64 or 1.56 p.c.
4.....	1.16	16	1.256 or 0.39 p.c.
5.....	1.32	32	1.1024 or 0.09 p.c.

Grading.—By this is meant the mating of a common, or relatively unimproved, parent with one that is pure-bred. It is usual that the pure-bred parent is the male. The practice of mating "grade" females to pure-bred males of the same breed as that which predominates in their own breeding is one by which a

rapid improvement in the quality of common stock may be brought about. By continuous mating in this way for five generations, the percentage of unimproved blood remaining is very small.

The following table shows the relative amount of unimproved blood remaining in each generation up to the sixth:

Generation	Sires		Dams		Offspring	
	p.c. Purity	p.c. of Purity	p.c. of Purity	p.c. of Unimproved	p.c. of Purity	p.c. of Unimproved
1.....	100	0	50	(1.2)	50	(1.2)
2.....	100	50	75	(3.4)	25	(1.4)
3.....	100	75	87.5	(7.8)	12.5	(1.8)
4.....	100	87.5	93.75	(15.16)	6.25	(1.16)
5.....	100	93.37	96.87	(31.32)	3.12	(1.32)
6.....	100	93.87	98.44	(63.64)	1.56	(1.64)

Cross-Breeding.—This involves the crossing of two distinct races, as the mating of a female of one breed with a male of a distinctly different breed. This practice is systematically carried on in some districts, in the belief that the offspring are superior to the pure-bred animals of either of

the two breeds employed. It is not usual for the progeny to be used for breeding purposes, as in such a system of breeding it is not advisable to carry the operation farther than the first generation.

Prepotency.—This is a term by which is expressed that quality which

enables a parent to transmit to a very marked degree its characteristics to its progeny. That all parents are not equally powerful in this respect is generally recognized. The importance to the breeder of using an animal, particularly a sire, which not only possesses desirable characters himself, but is able to transmit those characters to an unusual degree to

his offspring, is readily apparent. Unfortunately, outward appearances offer but little to guide in the determination of this character. It is to be expected to a greater degree in those animals who have descended on the side of both sire and dam from animals possessing to a high degree the characters sought for in the offspring.



Method of Marking Litters of Pigs. One notch in outer rim of right ear counts 1, in outer rim of left ear 3, in inner rim of right 10, and in inner rim of left 30. Combinations of these notches can easily be made to number up to 100, as shown in the Key. The three figures at the right of the Key show how the ears are marked for litters 5, 17, and 41. The litters each year should be numbered in the order of their birth, each pig of the litter given the same marking. Litter identification marks should always be entered in a record book.

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FEEDING AND COMPUTATION TABLES

Average digestible nutrients in common American Feeding Stuffs
Digestible nutrients in 100 lbs.

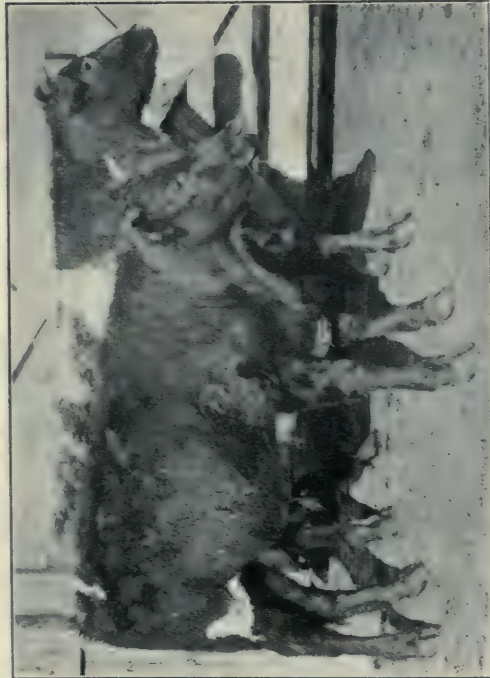
Name of Feed	Dry Matter in 100 lbs.	Protein	Carbo Hydrates	Ether Extract
ROUGHAGE				
Hay—				
Timothy.....	86.8	2.8	43.4	1.4
Orchard Grass.....	90.1	4.9	42.3	1.4
Red Top.....	91.1	4.8	46.9	1.0
Kentucky Blue Grass.....	78.8	4.8	37.3	2.0
Hungarian Grass.....	92.3	4.5	51.7	1.3
Mixed Grasses and Clover.....	87.1	6.16	42.71	1.46
Oat Hay.....	91.1	4.3	46.4	1.5
Barley.....	89.4	5.11	35.94	1.55
Red Clover, medium.....	84.7	6.8	35.8	1.7
Red Clover, mammoth.....	78.8	5.7	32.0	1.9
Alsike Clover	90.3	8.4	42.5	1.5
White Clover	90.3	11.5	42.2	1.5
Alfalfa	91.6	11.0	39.6	1.2
Straw—				
Wheat	90.4	0.4	36.3	0.4
Rye	92.9	0.6	40.6	0.4
Oat	90.8	1.2	38.6	0.8
Barley	85.8	0.7	41.2	0.6
Wheat Chaff	85.7	0.3	23.3	0.5
Oat Chaff	85.7	1.5	33.0	0.7
Green Fodders—				
Pasture Grasses (mixed)	20.0	2.5	10.2	0.5
Kentucky Blue Grass	34.9	3.0	19.8	0.8
Timothy	38.4	1.2	19.1	0.6
Orchard Grass	27.0	1.5	11.4	0.5
Red Clover	29.2	2.9	14.8	0.7
Alsike	25.2	2.7	13.1	0.6
Alfalfa	28.2	3.9	12.7	0.5
Fodder Corn—				
Fodder corn, green	20.7	1.0	11.6	0.4
Fodder corn, field cured	57.8	2.5	34.6	1.2
Corn stover, field cured	59.5	1.7	32.4	0.7
Corn silage	20.9	0.9	11.3	0.7
Roots and Tubers—				
Potato	21.1	0.9	16.3	0.1
Beet, common	13.0	1.2	8.8	0.1
Beet, sugar	13.5	1.1	10.2	0.1
Beet, mangel	9.1	1.1	5.4	0.1
Flat turnip	9.5	1.0	7.2	0.2
Rutabaga	11.4	1.0	8.1	0.2
Carrot	11.4	0.8	7.8	0.2
Parsnip	11.7	1.6	11.2	0.2
Artichoke	20.0	2.0	16.8	0.2
Concentrates				
Corn	89.1	7.9	66.7	4.3
Gluten Meal	91.8	25.8	43.3	11.0
Hominy Chops	88.9	7.5	55.2	6.8
Wheat	89.5	10.2	69.2	1.7
Wheat Bran	88.1	12.3	39.2	2.7
Wheat Shorts	88.2	12.2	50.0	3.8
Wheat Middlings	87.9	12.8	53.0	3.4

Drugs and Digestion

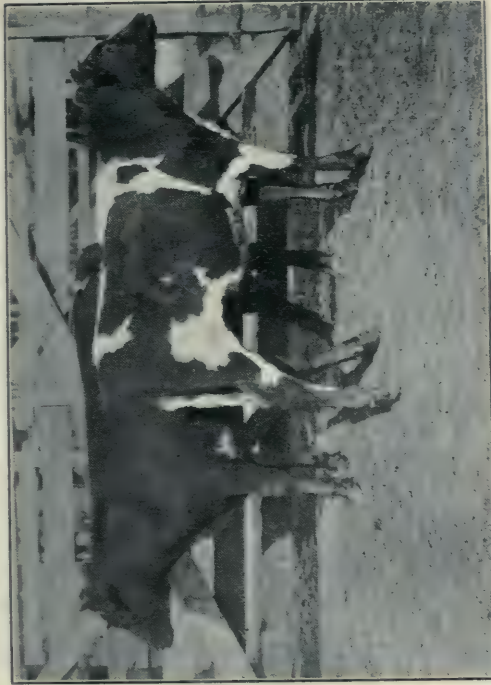
The mildly curative properties of the various drugs used in these feeds are well understood by most farmers and stock-men, as well as their limitations. The claims that by the use

of condiments and spices the digestibility of food can be increased, and in this way a saving of food can be effected, have no basis in fact. No experiments have demonstrated, or

made even probable, such an effect. However, perhaps the fact that variety of feeds enhances fattening because it aids digestion may be held a point in their favor. Whether this is of any value it is hard to say.



CHOICE YEARLING STOCKERS.



GOOD YEARLING STOCKERS.

Types of Market Cattle.

Feeding Dairy Cattle

Mr. J. H. Grisdale, Director of Experimental Farms, Ottawa, has issued the following statement with regard to the feeding of dairy cows at Ottawa. This statement will serve as a guide to the feeding of dairy cows under average conditions.

The winter ration has been on the average about as follows:

Hay	5 lbs.
Corn ensilage	30 lbs.
Roots	10 lbs.
Straw	4 lbs.
Meal	7 lbs.

The hay was mixed with clover and timothy. The corn silage was of good quality, rich in grain and well preserved.

The roots were mangels, sugar mangels, sugar beets or turnips. They were usually pulped and mixed with the ensilage.

The straw was, of course, oat, and was of good feeding quality. It was cut and mixed with the pulped root

and ensilage.

The meal usually consisted of a mixture of 800 lbs. of bran, 300 lbs. gluten meal, and 200 lbs. of linseed oil-cake meal.

The meal was scattered on the roughage mixture of roots, ensilage and cut straw after it was before the cattle. The hay given was uncut, and was fed after the other material had been cleaned up.

Of course the amount of roughage fed depends on the appetite of the cow; the amount of meal is influenced by the amount of milk being produced.

Her meal ration is gradually increased after calving, until at three or four weeks, she is supposed to be on full feed. The amount of meal is judged by the milk produced. If she responds freely to the increase in meal, she is fed the more liberally, usually up to that point where an increase in meal does not seem to

BRAMPTON JERSEYS

and their descendants are the absolute Jersey Champions of Canada

Breed, Type and Performance

B. H. Bull and Son

BRAMPTON, ONTARIO

Canada's Greatest Jersey Herd

induce a relative increase in the milk flow. One pound of meal for 4 lbs. of milk is liberal feeding; one pound of meal to three pounds of milk, to leave a profit, necessitates selling milk at a higher price than the average farmer may hope for. In this connection it may be observed that the quality, or composition of the meal ration is usually an important factor, affecting the milk yield. It is exceedingly important to remember that palatability in the meal, as well as the roughage, is an influence that is not infrequently underestimated. Variety in meals fed is advisable, but variety should mean a blending of meals, not a substitution

of one for another at frequent intervals. To illustrate, it is much better to feed a mixture of bran, oats, barley, oil-meal, gluten, cotton-seed meal, etc., than to feed any one of them for a time, to be subsequently replaced by some other.

Generally speaking, the meal ration for dairy cows should be rich in protein, palatable, easily digested and fairly finely ground, and blended to suit the roughage ration with which it is fed. Meals vary greatly as to composition and effect upon the digestive organs of the cattle. While some are laxative, some are constipating in effect, and while some seem to stimulate the appetite, others have the opposite tendency.

YIELDS OF VARIOUS BREEDS

Experiments conducted by O.A.C.
Period of time: 2 years and 3½ months, 1908-1911

Breed	Lbs. Milk	Lbs. Casein	Lbs. Fat	Average per cent	
				Casein	Fat
Ayrshire.....	77,734	2,023.30	3,115.36	2.604	4.01
Holstein.....	88,355	1,996.15	2,994.23	2.26	3.39
Jersey.....	56,685	1,530.15	2,716.95	2.69	4.79

ANALYSIS OF CREAM

	Rich Cream	Separated Cream	Skim Milk	Separated Milk	Separat'd Residue
Water.....	55.0	66.1	90.0	90.8	67.3
Albuminoids.....	6.0	2.6	3.7	3.3	25.9
Butter Fat.....	36.2	27.9	0.8	0.2	1.1
Milk Sugar.....	2.5	3.0	4.8	5.1	*2.1
Ash.....	0.3	0.4	0.7	0.6	3.6
	100.0	100.0	100.0	100.0	100.0

Rations

The following daily rations are suggested for dairy cows in good milk flow:

(1)

Corn Silage	35 lbs.
Clover Hay	12 "
Wheat Bran	4 "
Oats (ground)	3 "

(2)

Corn Silage	40 lbs.
Alfalfa Hay	15 "
Corn (ground)	3 "

(3)

Clover Hay	20 lbs.
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Mangels	25 lbs.
Oats (ground)	3 "
Corn (ground)	3 "

(4)

Corn Silage	40 "
Clover Hay	16 "
Mangels	30 "
Wheat Bran	4 "
Ground Oats	3 "
Gluten Meal or	} 1 "
Cottonseed Meal	
or Oil Meal	



COMMON STOCK HEIFERS.



GOOD CUTTERS.



MEDIUM CANNERS.

Types of Market Cattle.

Tuberculosis of Farm Animals

The frequent appearance of tuberculosis among the various classes of farm animals, especially dairy cattle, and the consequent alarm which has been created owing to this menace to the health of persons, and to the prosperity of the dairying industry, makes it highly advisable to use every means possible to spread a knowledge of the nature and ravages of this disease. We have selected the following treatise from the reports of the International Commission on the Control of Bovine Tuberculosis.

"Tuberculosis is a wide-spread disease affecting animals and also man. Human beings and cattle are its chief victims, but there is no kind of animal which will not take it. Hogs and chickens are quite often affected; horses, sheep and goats but seldom, while cattle are the most susceptible of all animals.

Cause of Loss

"Tuberculosis is contagious, or 'catching.' It spreads from cow to cow in a herd until most of them are affected. The presence of the disease may not attract much attention from the owner, as it is slow to develop, and a cow may be affected with it for several months, and sometimes years, before any signs of ill-health are to be seen.

"This slow development is the chief reason for the great loss to the farmer. He does not suspect its presence in his herd until, perhaps, a large number are diseased. If the disease developed rapidly and caused death in a comparatively short time, the owner would soon take steps to check its progress and to protect the rest of his herd. Tuberculosis is slow and hidden in its course, and thus arouses no suspicion until great damage is done.

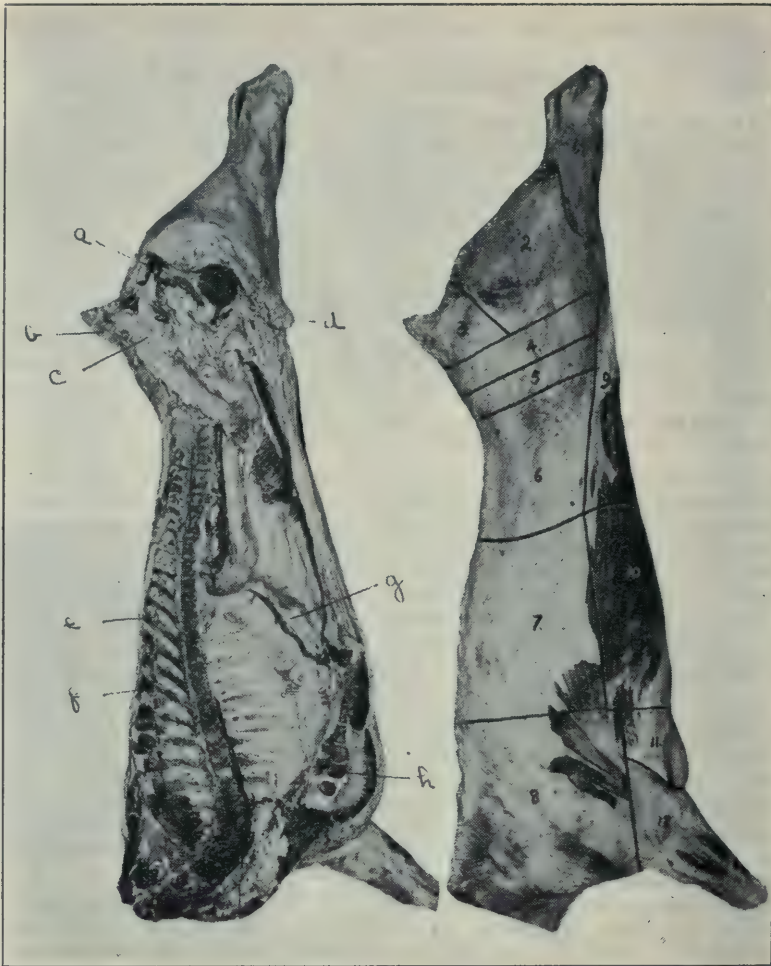
"Over a century ago its contagious nature was suspected, and many facts were recorded to prove that it must be 'catching.' Doctors differed about it, and for a long time the question

was hotly disputed. Finally, it was settled by Dr. Robert Koch, a distinguished German physician, who discovered the germ of the disease in the year 1882, and named it *bacillus tuberculosis*. He proved by experiment that the disease is produced by these germs, and without them the disease cannot be produced. It is now universally admitted that tuberculosis is a contagious disease, and may be transmitted from one animal to another, and from animals to man.

"The importance of the disease must be estimated from two points of view: First, the loss it entails upon the cattle owner, and second, the danger of communi-^{ca}tion to human beings. Consider first the effect upon the pocket of the owner of the cattle. A serious percentage of the dairy cows of this continent are affected. It is no uncommon thing to find as many as 70 or 80 per cent. of the cows in a herd diseased. These animals will be in various stages, some recently infected, showing no sign of ill-health; others badly diseased, but outwardly appearing healthy; while a few are evidently breaking down and wasting away.

"Turning to the other aspect of the case—the danger of infection of human beings with tuberculosis from cattle—we have only to consider a few facts to realize its vital importance to every community. Milk is the staple food of infants and young children, and is usually taken in the raw state. If this milk is taken from a tuberculous cow, it may contain millions of tubercle germs. Young children fed on such milk often contract the disease, and it is a frequent cause of death among them.

"Meat from tuberculous cattle is not so likely to convey the infection for several reasons. It does not so frequently contain the germs, and cooking will destroy those which may be present, and lastly, meat is not consumed by very young children.



BEEF CUTS OF A PRIME STEER.

Hind Shanks	1	} Round	} Hind Quarter
Round R. & S. off	2		
Rump	3		
Loin end	4	} Loin	
Loin end	5 } Flatbone		
Pinebone Loin	6 } Loin..		
Flank	9	} Back	} Fore Quarter
Rib	7		
Chuck	8		
Rib	7	} Piece	
Plate	10		
Chuck	8	} Triangle	
Plate	10		
Plate	11		
Shank	12		

(a) Aitch-bone; (b) Rump-bone; (c) Crotch; (d) Cod; (e) Chine-bones; (f) Buttons; (g) Skirt; (h) Breast-bone.

Lakeview Holsteins

Herd Sire, Count Hengerveld Fayne De Kol. He now has 15 daughters in the Record of Merit, and many more yet to be heard from. His sire, Pietertje Hengerveld's Count de Kol, has 98 A. R. O. daughters and 47 proven sons. He is the only sire as yet to have 13 daughters making an average of better than 100 lbs. of milk each in one day. His dam, Grace Fayne 2nd, has a seven day record of 26.30 lbs. and is the dam of the long time World's Champion, Grace Fayne 2nd's Homestead, 35.55 lbs. in seven days.



Second Sire, Dutchland Colantha Sir Mona. He has no daughters yet in milk, but they will shortly be heard from. His sire, Colantha Johanna Lad, has now more than 60 A. R. O. daughters, amongst which are found three World's Championships for yearly production. He is a son of the famous cow, Colantha 4th's Johanna, 1247.82 lbs. of butter in one year. His dam is Mona Pauline De Kol, 27.18 lbs. of butter in seven days, and the dam of one cow with a record of 33.78 lbs., one with 27.26, and three others over 20 lbs.

The Lakeview Farm is halfway between Toronto and Hamilton, on the Grand Trunk Railway, and visitors are always welcome.

E. F. Osler,
Bronte, Ontario

Detection of Infected Animals

"The detection of animals affected with tuberculosis is rendered much more difficult by the fact that animals may be suffering from this disease in quite advanced stages, and to have been a source of infection to the rest of the herd for a considerable time, and yet not exhibit any outward symptoms which would cause the owner to suspect the presence of this dreaded disease. A cough is not evidenced save where the lungs are affected, and all the organs of the body are liable to attack. The disease will likely to have progressed to a very advanced stage before such symptoms as unthriftiness, loss of flesh, and a general appearance of lack of vigor will arouse the suspicions of the attendant.

Many of the symptoms that are relied on by the human physician in reaching his opinion are not available in examining cattle. The thickness of the skin and of the chest wall, for instance, makes it difficult to detect a diseased condition of the lungs by listening to the sounds made in breathing, whereas this is comparatively easy in human beings. Science has, however, discovered a test by which the presence of this disease may be detected, even when no outward symptoms are exhibited. This is known as the **tuberculin test**, because the substance used in making it is called tuberculin.

"Tuberculin does not harm healthy cattle, even in large doses, but on diseased animals it produces a marked effect. This is shown by a feverish attack, which comes on about eight or twelve hours after the tuberculin is administered, lasts a few hours, and then subsides. This temporary fever is called the **reaction**, and animals which show it are called **reactors**. The value of the test lies in the fact that diseased animals react while healthy ones do not.

"The tuberculin test in the hands of a competent and experienced man is much more accurate than any

other method of detecting tuberculosis. The records of a large number of tests made by Government officials show that, with certain precautions, it is accurate in 98 per cent. of the reactions obtained. This gives a margin of a possible 2 per cent. of error, and this small number may be still further lessened by care in making the test. For practical purposes, any animal which reacts must be considered tuberculous.

"It must be recognized that there are some limitations to the test as an indicator of the presence of the disease. As has been stated, the indication given is by setting up a slight feverish condition in a diseased animal; hence, it is quite apparent that the test should not be applied to any animal which, from any cause, may be expected to show a slightly increased temperature from causes other than that brought about by the injection of the tuerculin serum. The test should not be applied to cows which have just calved, or are about to calve, as the temperature at this time is apt to vary considerably from the normal. For the same reason, the test should not be applied to cows about to enter upon the period of oestrus.

The test also fails to detect the disease in animals very recently infected. The disease has to make a little progress before the test reveals its presence; and in the beginning of each case there is a period between the entrance of the germs into the body and the time when they will have multiplied sufficiently for the test to reveal their presence. This is called the period of incubation, and lasts from ten days to two months.

"When the disease is far advanced and the animal is wasting, the animal will frequently fail to show the characteristic reaction indicating the presence of the disease. This is not of much practical importance, as such cases can generally be recognized without the aid of tuberculin.

"For some years efforts have been made to discover a method of rendering cattle immune to the disease in such a way as men are protected from smallpox by vaccination. Up to the present, these efforts have

been only partially successful, and until the methods in use have been perfected by further investigations, they cannot be recommended as of practical use in the suppression of the disease.

Recommendations for the Eradication of the Disease

"The following plan of procedure is recommended in the case of herds which have been shown, after being subjected to the tuberculin test, to be infected with tuberculosis. It is recognized that in order to meet individual needs, there are several points in which there are opportunities to change or modify the directions herein given. It must be understood, however, that whenever such changes or modifications are made they should conform in the greatest detail to the principles herein laid down. The plan has for its purpose the conservation of the herd whenever that is possible.

"In herds which are free from infection the preventive measures necessary consist simply in keeping tuberculous animals away from the sound ones; in keeping tuberculous animals out of pastures, sheds or stables where the sound ones may be kept. It must be recognized that there is a danger in exposing healthy animals to infection at public sales

should not be fed to calves, pigs or other animals. Cars that have not been thoroughly disinfected should not be used for the transportation of sound cattle. Cattle that are purchased to go into sound herds should be bought from healthy or sound herds only.

or exhibitions. Raw milk, or milk by-products, from tuberculous cows

The eradication of tuberculosis from infected herds requires for conservation of the herd, different procedures according to the extent of the infection. For a guide to the control of the disease, tuberculous herds may be divided into three groups, namely:

"1. Where 50 per cent. or more of the animals are infected.

"2. Where a small percentage (15 per cent. or less) of the animals are infected.

"3. Where a large number (15 per cent. to 50 per cent.) of the animals are diseased.

How to Proceed

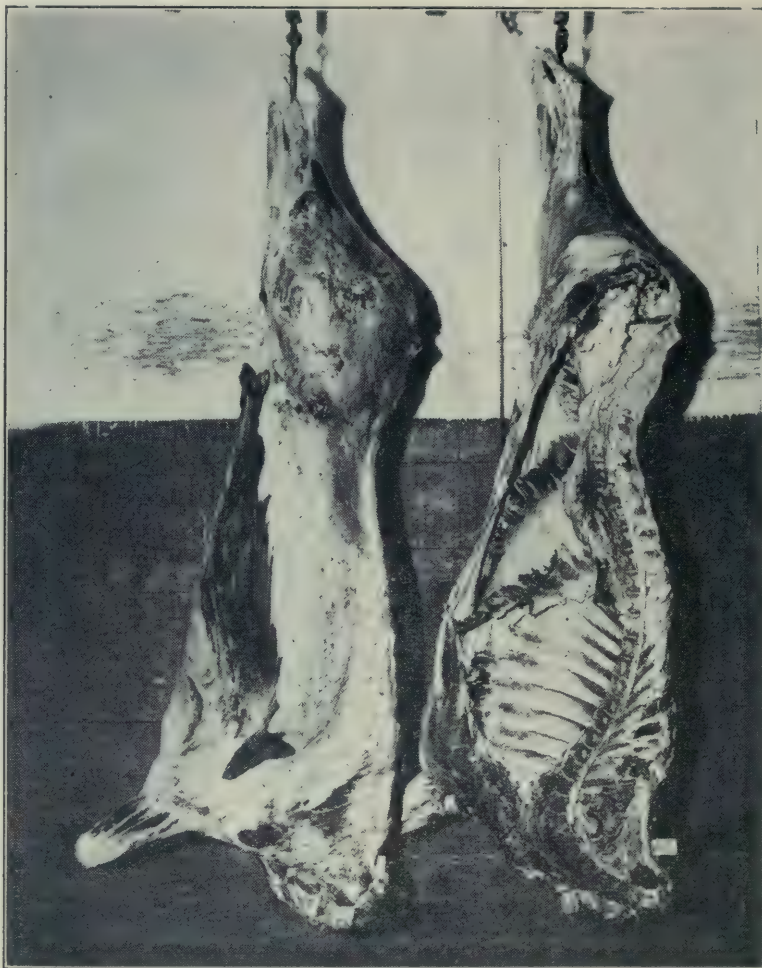
"Group 1.—Eliminate by slaughter all animals giving evidence of the disease on physical examination.

"Build up an entirely new herd from the offspring. The calves should be separated from their dams immediately after birth and raised on pasteurized milk, or milk from healthy cows. This new herd must be kept entirely separate from any reacting animals. The young animals should be tested with tuberculin at about six months old, and when reactors are found at the first or any subsequent test, the others should be re-tested not more than six months later. When there are no more re-

actors at the six months' test, annual tests should thereafter be made. All reacting animals should at once be separated from the new herd, and the stables which they have occupied thoroughly disinfected. When the newly developed sound herd has become of sufficient size, the tuberculous herd can be eliminated by slaughter, under inspection, for beef.

"Group 2.—The reacting animals should be separated from the non-reacting ones and kept constantly apart from them at pasture, in the yards or in the stables.

"(a) Pasture. — The reactors should be kept in a separate pasture.



CARCASS OF A COMMON STEER.

In order that a beef carcass may be classed in the highest grade it must possess certain characteristics. 1st—It must be compact in form and show that thickness of loin, round the rib which indicates an abundance of lean meat. 2nd—In order that this lean meat may be most desirable from the consumer's standpoint, the carcass must possess a fairly high percentage of fat. This is indicated externally by a complete cover of fat over all parts of the body, an unfinished carcass showing a light covering of fat on the back and scarcely any on the plate and round. When the carcass is ribbed, or divided into fore and hind quarters, the "eye of lean" or large, loin muscle must contain fat veins indicating that the lean meat has sufficient fat cells deposited through it to give that juiciness and flavor to the meat which a lean carcass does not possess. Coarse, stringy fibres indicate a lack of quality, while a fine, velvety surface of the cut indicates that quality of lean which, if sufficiently well finished, gives the qualities of tenderness, flavor and juiciness which are so necessary to the best in a beef cut. 3rd—The color of the flesh should be rich red, and the fat clear white. 4th—The flesh should be firm, sound and free from bruises.

This pasture should be some distance from the other, or so fenced that it will be impossible for the infected and the non-infected animals to get their heads together.

"(b) Water.—When possible to provide otherwise, reacting cattle should not be watered at running streams which thereafter flow directly through fields occupied by sound cattle. The water from a drinking trough used by infected animals should not be allowed to flow into stables, fields or yards occupied by sound animals.

"(c) Stables. — Reacting cattle should be kept in barns or stables entirely separate from the ones occupied by the sound animals.

"Calves from the reacting cows should be removed from their dams immediately after birth. Milk fed to these calves must be from healthy cows; otherwise, it must be properly pasteurized. These calves should not come in contact in any way with the reacting animals.

"The non-reacting animals should be tested with tuberculin in 6 months, and when reactors are found at the first six months, or at any subsequent test, the others should be tested not more than six months later. When there are no more reactors at the six months' test, annual tests should thereafter be made. All reacting animals should at once be separated from the new herd, and the stables which they have occupied thoroughly disinfected.

"The milk of the reacting animals may be pasteurized and used.

"Any reacting animal which develops clinical symptoms of tuberculosis should be promptly slaughtered.

"An animal which has once reacted to tuberculin should under no circumstances be placed in the sound herd.

"As soon as the sound herd has been well established, infected ani-

mals should be slaughtered, under proper inspection.

"Group 3.—Herds which come within this group should be dealt with either as in Group 2, where the herd is separated, or as in Group 1, where all the animals are considered as suspicious, and an entirely new herd developed from the offspring.

"In all cases, animals which show clinical evidences of the disease should be promptly eliminated. They should be destroyed if the disease is evidently far advanced; if not, they may be slaughtered for food under proper inspection.

"All milk from tuberculous cows that is used for food purposes should be thoroughly pasteurized. This means that it must be heated sufficiently to kill or to render harmless any tubercle bacilli that may be present in it. For this it is necessary to heat the milk for twenty minutes at 150 degrees Fahr., or for five minutes at 180 degrees.

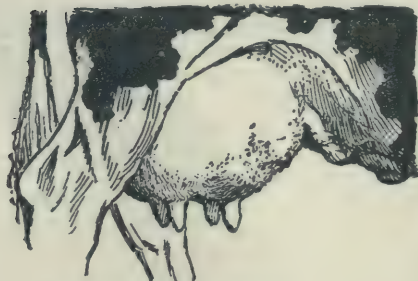
"It is important that pails and other utensils used in carrying the unpasteurized milk should not be used, unless previously sterilized, for storing the milk after it is pasteurized.

When diseased animals are found, the stables from which they are taken should be thoroughly cleansed and disinfected. To accomplish this, all litter should be removed; floors and ceilings should be carefully swept, and the floors, together with the mangers, thoroughly scrubbed with soap and water. Thorough cleansing before the application of the disinfectant cannot be too strongly emphasized. After cleansing, a disinfectant should be applied. A five per cent (5 per cent.) solution of carbolic acid, a 1-1000 solution of corrosive sublimate, or a four per cent. (4 per cent.) solution of sulphuric acid may be used.

If tuberculous cattle have been kept in a small yard, the litter should be removed, the surface ploughed, and the fencing and other fixtures thoroughly cleansed and disinfected.

**SCORE CARD AS RECOMMENDED BY PROF. H. H. DEAN OF O.A.C.
FOR DAIRY CATTLE**

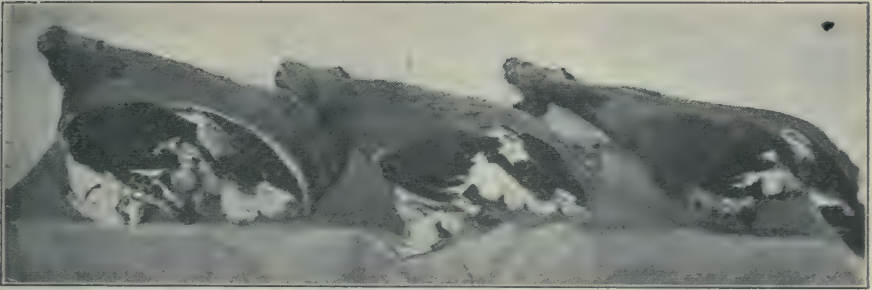
SCALE OF POINTS		Possible Score
<hr/>		
A. GENERAL APPEARANCE: 16 points.		
Estimated Weight: lbs.		
Form, wedge-shaped, as viewed from front and top; straight top line, and great depth of barrel.....		5
Quality, hair, soft and fine; skin, of medium thickness, mellow and elastic; secretion, yellow; bone, fine and clean.....		6
Style, active, vigorous, showing strong character; temperament, inclined to nervousness, but not irritable or vicious.....		5
B. HEAD AND NECK: 8 points.		
Muzzle, broad and clearly defined; mouth and nostrils large.....		1
Eyes, large, prominent, clear, and placid.....		1
Face, lean and somewhat long, fine between muzzle and eyes.....		1
Forehead, broad.....		1
Ears, of fine texture, and medium size; secretion, abundant.....		1
Neck, thin, rather long, fine and clean at junction with head; no noticeable amount of dewlap.....		3
C. FOREQUARTERS: 6 points.		
Withers, lean and sharp; vertebrae somewhat higher than blades.....		2
Shoulders, light, good distance through from point to point, but sharp on top; smoothly blended into body.....		2
Legs, well apart, straight and short; shank, fine and smooth.....		2
D. BODY: 22 points.		
Chest, deep, full between back of fore-legs, no depression behind shoulder blade.....		6
Ribs, long, broad, and wide apart; well sprung; giving a large, deep barrel		10
Back, lean, straight, and open-jointed; sharp chine and broad loin.....		6
E. HINDQUARTERS: 13 points.		
Hooks, wide apart.....		2
Rump, long and wide.....		3
Pin Bones, high and wide apart.....		1
Thighs, thin.....		2
Legs, straight, and set well apart; shank, fine and smooth.....		2
Escutcheon, spreading over thighs and extending far upwards.....		2
Tail, long and fine, terminating in a switch of fine hair.....		1
F. MILK VESSELS, ETC.: 35 points.		
Udder, long, wide, deep, but not pendulous, firmly attached, extending well up behind and far forward; quarters, even and free from fleshiness....		25
Teats, large, uniform, and evenly placed.....		5
Milk Veins, large, long, crooked and branching.....		3
Milk Wells, large and numerous.....		2
Total.....		100



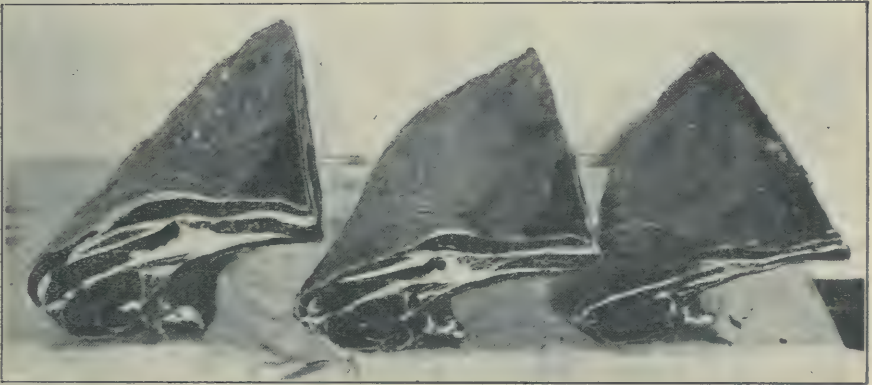
A Well Formed Udder.



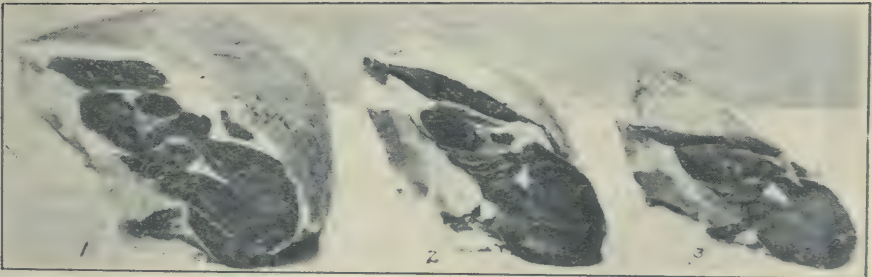
A Poorly Formed Udder.



Rounds No. 1, 2 and 3 grades.



Ribs No. 1, 2 and 3 front.



Flat Bone 1, 2 and 3 grades.

CUTS OF BEEF ILLUSTRATED.

Accompanying illustrations show Nos. 1, 2 and 3 grades of rounds (Fig 3); front view of 1, 2 and 3 grade of ribs (Fig. 4); and 1, 2 and 3 grades of plate bone loin (Fig. 5). Note the fulness, marbling and covering in the higher compared with that in the lower grades.

Score Card as Recommended by Prof. G. E. Day, of O.A.C., for Swine of Bacon Type

Scale of Points.		Possible Score.		
A. General Appearance:		35		
points.				
Size, well developed for age..		5	shoulder and ham	6
Form, long, smooth, all parts proportionately developed so as to give the impression of a well-balanced, strongly-built animal. Top line, strong; under line, straight; belly trim and neat.....		10	Breast, good width and full..	3
Quality, hair, fine; skin, smooth, showing on tendency to wrinkle; bone, clean and strong but not coarse; flesh, firm and smooth, with no flabbiness at jowl, fore-flank, belly or ham		10	Fore Legs, set well apart, medium length and straight; pasterns, upright; bone, clean and strong; feet, medium size and strongly formed	4
Condition, well covered with firm flesh, especially along			D. Body: 30 points.	
Style, active and sprightly, back and loin, but not heavily loaded with fat.....		6	Back, medium width, rising slightly above the straight line, and forming a very slight arch from neck to root of tail	6
walking without a swaying movement, and standing well up on toes. Breeding animals should show strong character		4	Loin, wide as rest of back, strong and full, but not unduly arched	5
B. Head and Neck: 8 points.			Ribs, good length and moderately arched	4
Snout, medium length and moderately fine		1	Side, fairly deep; long, smooth and straight between shoulder and ham; a straight-edge laid over shoulder point and ham should touch the side throughout	8
Face, broad between eyes; poll broad and full		1	Heart Girth, full, but not flabby at fore-flanks, filled out even with side of shoulder; there should be no tucked-up appearance back of fore-legs, nor droop back of shoulder top	5
Eyes, good size, full and bright		1	Flank, full and low	2
Jowl, fair width and muscular, but very neat, showing no flabbiness		2	E. Hindquarters: 14 points.	
Ears, moderately thin, and fringed with fine hair.....		1	Rump, same width as back; long and slightly rounded from a point above hips to tail, and somewhat rounded from side to side over top..	4
Neck, medium length and muscular, but possessing no tendency to arch on top..		2	Ham, full without flabbiness; thigh, tapering towards hock without wrinkles or folds, and carrying flesh well down towards hock...	6
C. Forequarters: 13 points.			Hind Legs, medium length; hocks, set well apart, but not bowed outward; bone, clean and strong; pasterns, upright; feet, medium size and strongly formed.....	4
Shoulders, smooth, somewhat rounded from side to side over top, and very compact; no wider than back, and not running back on side so as to shorten distance between			Total	100

Score Card as Recommended by Prof. G. E. Day, of O.A.C., for Beef Cattle.

Scale of Points.	Possible Score	
A. General Appearance: 23 points.	23	
Estimated weight.....lbs.		Eyes, large, prominent, clear and placid 2
Weight, according to age.... 4		Face, short, with clean cut appearance 1
Form, deep, broad, low set, smooth; top line and under-line straight 8		Forehead, broad 1
Flesh, naturally thick fleshed. See further under quality.. 4		Ears, medium size and fine texture 1
Quality, bone strong, but of fine texture and clean; skin pliable and elastic; hair, soft and thick. All parts evenly covered with firm flesh, which should be mellow to the touch, but not soft and flabby nor yet in hard rolls or ridges..... 8		Neck, thick and short, with full neck vein; junction of neck with head clearly defined. In bull, crest well developed 5
Style, active, and vigorous, but not restless; should show strong character 4		Horns (when present) fine in texture, flattened at base, not more than medium size 5
B. Head and Neck: 12 points.		C. Forequarters: 11 points.
Muzzle, broad and clearly defined; mouth large; nostrils large 2		Shoulders, smooth, covered with flesh, well laid back into ribs, compact and moderately broad on top..... 5
		Brisket, prominent and blunt; breast full and wide..... 3
		Dewlap, light 1
		Legs, straight and short; arm broad and well muscled; bone flat, clean and strong.. 2

Western Cattle Market Toronto

Operated Exclusively by the Municipality

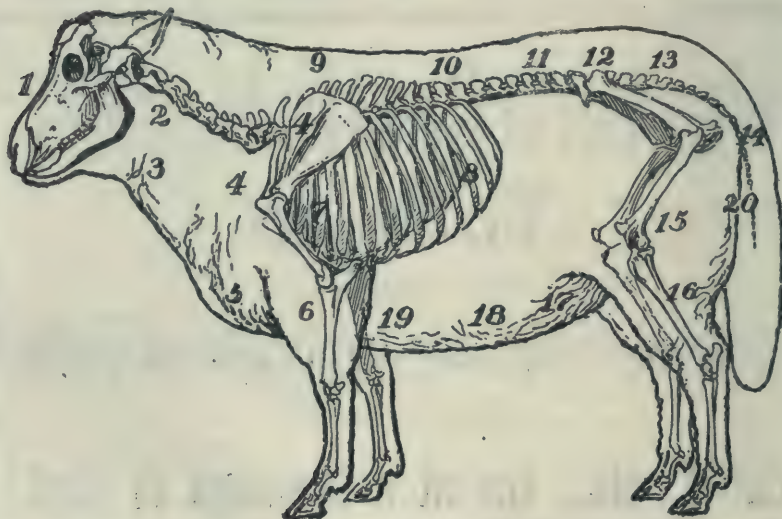
Cattle, etc., Fed at a Minimum of Cost

Best Abattoir in America in Connection

D. Body: 29 points.		well covered, not prominent	4
Chest, deep and wide; fore		Sirloin and Rump, straight on	
Flank, full and even with		top, long, wide, well filled	
shoulders well filled, leaving		between hook and pin-bones.	
no depression; heart		smooth	5
girth large	9	Pin-bones, wide apart, smooth,	
Ribs, long, well arched;		not patchy	2
thickly fleshed	7	Tail Head, smooth; in line	
Back, broad, straight, well		with back; tail fine, falling	
fleshed and smooth	7	at right angles to top line.	1
Loin, deeply fleshed, coming		Thighs, full, deep and wide..	3
out full to hocks and carrying		Twist, full and deep, nearly as	
width evenly from		low as flank	3
Hocks, wide, but smooth and		Legs, straight and short; bone	
flanks, full; space back of		flat, clean and strong	2
underline	3		
E. Hindquarters: 20 points.		Total	100
Hocks forward	5		

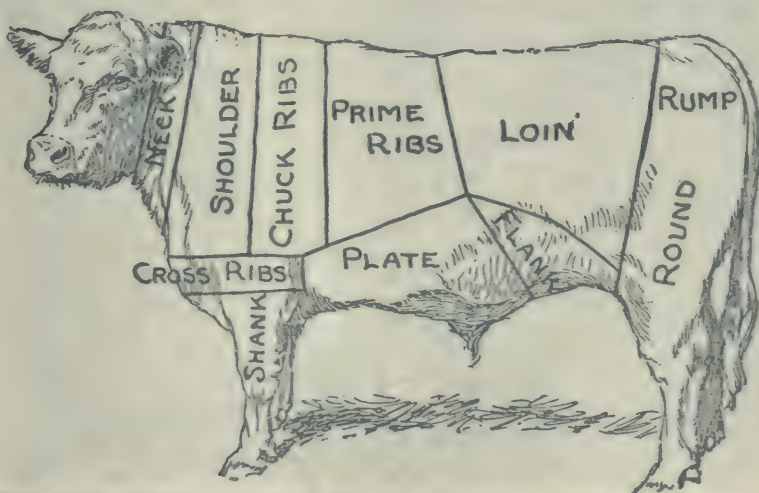
**Score Card as Recommended by Prof. G. E. Day, of O.A.C., for
Mutton Sheep**

Scale of Points.	Possible Score.	
A. General Appearance:	24	line straight
points.		Quality, bone strong, but of
Estimated weight .....lbs.;		fine texture and clean; hair
score according to age	4	soft and thick; skin fine;
Form, deep, broad, low set, of		all parts evenly covered
proportionate length, and		with firm flesh which should
smooth; top line and under		be mellow to the touch, but
		not soft and flabby, nor yet
		in hard rolls or ridges;



Parts of Sheep. 1, Head; 2, Neck; 3, Shoulder Vein; 4, Shoulder; 5, Bris-ket; 6, Foreleg; 7, Chest; 8, Ribs; 9, Top of Shoulders; 10, Back; 11, Loin; 12, Hip; 13, Rump; 14, Tail; 15, Giggot or Leg of Mutton; 16, Hind Leg; 17, Flank; 18, Belly; 19, Fore Flank; 20, Twist.

- light in offal 8
- Style, spirited and attractive, indicating vigor and breeding 4
- B. Head and Neck: 11 points.
- Muzzle, fine, lips thin, but large mouth and nostrils.. 1
- Eyes, prominent and bright.. 1
- Face, short, clean-cut appearance 2
- Forehead and Poll, wide between the eyes and also between the ears 2
- Ears, medium size, fine texture, erect 1
- Neck, thick and short, tapering nicely from shoulders to head, with full neck vein, and broad and full on top in front of shoulders, carrying head erect; throat free from folds; in ram, crest well developed.....
- C. Forequarters: 6 points.
- Shoulders, fitting smoothly into ribs, evenly covered with flesh, moderately broad, but compact on top 4
- Legs, straight and short; set well apart; strong but with clean smooth shank; pasterns strong and upright; arm broad and well muscled 2
- D. Middle: 26 points.
- Chest, deep and wide; breast full; brisket prominent and blunt; space back of shoulders well filled, leaving no depression; heart girth large 9
- Back and Ribs, back broad and straight, well fleshed and smooth; ribs deep, well arched, thickly fleshed..... 9
- Loin, deeply fleshed, coming out full to hips and carrying width evenly from hips forward 6
- Flank, full and even with the underline 2
- E. Hindquarters: 17 points.
- Hips, wide, level, smooth.... 3
- Rump, long, wide, level, well filled from hips to tail head, smooth 4
- Thighs, full, deep and wide, both on inside and outside. 4
- Twist, full and deep, nearly as low as flank..... 4
- Legs, straight and short, set well apart, strong, but with clean, smooth shank; pasterns strong and upright.. 7



"Illustration of Beef Animal, indicating the various cuts of beef as they are known to the trade."

F. Fleece and Skin: 16 points.**(1) Wool:**

Quantity, long, dense,
even 6
Quality, fine, pure, crimp,
close, regular, even .. 5
Condition, bright, sound,

clean, lustrous, good
secretion of yolk..... 4

(2) Skin:

A healthy, light cherry
color and free from
dark spots 2

Total100



Choice Cow Carcass.

Registration of Pure-Bred Live Stock

All pure-bred animals, in order that they may be recognized as such, must be recorded in some recognized Stud, Herd or Flock Book. In Canada, the records are kept under the supervision of the society or club formed for the advancing of the interests of each particular breed.

For purposes of economy and other reasons, all these Breed Associations—with the exception of the Holstein-

Friesian Association of Canada—united to form the Canadian National Live Stock Records, whose headquarters are at Ottawa. All applications for registration or transfer of pure-bred live stock should be addressed to The Accountant, Canadian National Records, Ottawa, Ont., or, in the case of Holstein-Friesian cattle, to the Secretary, W. A. Clemons, St. George, Ont.

CANADIAN BOOKS OF RECORD

HORSES

Name of Breed	Book of Record	Name of Association.
Clydesdale	Clydesdale Stud Book of Canada	Clydesdale Horse Association of Canada.
Hackney	Canadian Hackney Stud Book	Canadian Hackney Horse Society.
Shire	Canadian Shire Horse Stud Book	Canadian Shire Horse Association.
Percheron	Canadian Percheron Stud Book	Canad. Percheron Horse Breeders' Association.
Thoroughbred	Canadian Thoroughbred Stud Book	Canadian Thoroughbred Horse Society.
Belgian Draft	Canadian Belgian Draft Stud Book	Canadian Belgian Draft Horse Breeders' Association.
French Canadian	French Canadian Horse Breeders' Stud Book	French Canadian Horse Breeders' Association of Canada.
Shetland, Welsh, New Forest, Polo and Riding, Exmoor and Hackney Ponies	Canadian Pony Stud Book	Canadian Pony Society.
French Coach	Canadian French Coach Stud Book	Canadian French Coach Horse Breeders' Association.
Suffolk Horse	Canadian Suffolk Horse Stud Book	Canadian Suffolk Horse Society.
Standard Bred	Canadian Standard Bred Stud Book	Canadian Standard Bred Horse Society.

CATTLE

Name of Breed	Book of Record	Name of Association.
Shorthorn	Dominion Shorthorn Herd Book	Dominion Shorthorn Breeders' Association.
Ayrshire	Canadian Ayrshire Herd Book	Canadian Ayrshire Breeders' Association.
Hereford	Canadian Hereford Herd Book.	Canadian Hereford Breeders' Association.
Jersey	Canadian Jersey Cattle Club Record	Canadian Jersey Cattle Club.

CANADIAN BOOKS OF RECORD

CATTLE—Continued.

Name of Breed	Book of Record	Name of Association
Galloway.....	North American Galloway Herd Book	North American Galloway Association.
Aberdeen Angus.....	Canadian Aberdeen Angus Association's Record	Canadian Aberdeen Angus Association.
Guernsey.....	Canadian Guernsey Herd Book	Canadian Guernsey Breeders' Association.
French Canadian.....	French Canadian Cattle Breeders' Herd Book	French Canadian Cattle Breeders' Association of Canada.
Red Polled.....	Canadian Red Poled Herd Book	Canadian Red Polled Association.
Holstein-Friesian.....	Holstein-Friesian Herd Book of Canada	Holstein-Friesian Association of Canada.

SWINE

Name of Breed	Book of Record	Name of Association
Yorkshire, Berkshire, Tamworth, Chester White, Poland China, Duroc Jersey, Hampshire, Essex.....	Dominion Swine Breeders' Record	Dominion Swine Breeders' Association.

SHEEP

Name of Breed	Book of Record	Name of Association
Shropshire, Leicester, Oxford Down, Cotswold, Lincoln, Dorset, Hampshire, Southdown, Suffolk Cheviot, Blackface	Canadian National Records	Dominion Sheep Breeders' Association.

Membership Fees

The annual membership fee to each Association is \$2.00, with the following exceptions: Canadian Hackney Horse Society, \$3.00; Dominion Sheep Breeders' Association, Cana-

dian Jersey Cattle Club, North American Galloway Association, Canadian Guernsey Breeders' Association, French-Canadian Cattle Breeders' Association and the French-Canadian Horse Breeders' Association, \$1.00.

Transportation of Pure-Bred Animals

All animals recorded in the Canadian National Records are entitled to reduced freight rates over the Grand Trunk, Grand Trunk Pacific, Intercolonial, Canadian Pacific and Canadian Northern Railways when shipped for breeding purposes. These

rates do not apply when animals are shipped to Exhibitions, or for the purpose of contesting in races. Canadian freight classifications as to weights govern.

There is no reduction when animals are shipped by express.

Rules and Regulations Governing Eligibility of Animals for Registration

Horses

Clydesdale

Imported Animals.—Stallions and mares, recorded and bearing registration numbers in the Clydesdale Stud Book of Great Britain and Ireland, whose sires and dams, together with their sires and dams, are also recorded and bear registration numbers in said Stud Book, provided that the breeding of such sires and dams, if already recorded in the Clydesdale Stud Book of Canada as ancestors, comply with this rule.* (See Note.)

When recording animals imported in dam, certificate of service must be furnished from the breeder, signed by the owner of the sire at the time of service.

An imported animal is one which has been imported from Great Britain and Ireland. Applications for

registration of animals imported from Great Britain after April 1st, 1909, must be accompanied by a tabulated certificate in addition to the regular export certificate issued by the Clydesdale Society of Great Britain and Ireland, showing ancestors, numbered as stated above.

Canadian-Bred Animals.—(a) Stallions and mares by sires and out of dams recorded in the Clydesdale Stud Book of Canada.

(b) Clydesdale mares having four top crosses by sires recorded in the Clydesdale Stud Book of Canada. Application for registration of four-cross pedigrees shall be certified and sworn to, or affirmed by the breeder before an officer authorized to administer oaths.

Fees for Registration

For Imported Animals			For Canadian Bred Animals		
	To Members	To Non-Members			
Males, if recorded within 30 days after importation	\$ 4.00	\$ 3.00	Animals under 12 months of age.....	\$1.00	\$2.00
Females, if recorded within 30 days after importation.....	2.00	3.00	Animals over 12 months of age.....	2.00	4.00
Males, if not recorded within 30 days after importation.....	50.00	25.00	Registration of transfers..	.50	
Females, if not recorded within 30 days after importation.....	25.00	50.00	Duplicate certificates....	.50	
			New certificates, replacing old ones from which shipping vouchers have been used.....	.50	
			Extended Tabulated Pedigrees.....	.50	2.00

*Note.—The breeding of many horses recorded in the Scottish Book does not come up to this standard.

Hackney

Animals bred in Great Britain or Ireland, recorded in the English Hackney Stud Book.

(a) Stallions with three top crosses of * full registered sires, and with two registered dams.

(b) Mares with two top crosses of *full registered sires and with one registered dam.

(c) Mares with one top cross of *full registered sires and with a registered inspected dam.

*Full registered sires are those (a) that are recorded as such in any of the first sixteen volumes of the English Hackney Stud Book, or (b) those recorded since volume 16, providing they were eligible to full registry

under the rules in force for entries in volume 16 of the English Hackney Stud Book.

Note.—Stallions or mares imported prior to the date of the incorporation of these rules, February 1, 1910, will be admitted to registry.

Stallions and mares full registered in the American Hackney Stud Book, provided, if, upon investigation, pedigrees are found to be equal to the Canadian standard of breeding.

Canadian-Bred Animals.

(a) Stallions with three top crosses of Hackney sires recorded in the

Canadian Hackney Stud Book.

(b) Mares with two top crosses of Hackney sires recorded in the Canadian Hackney Stud Book.

Note.—All eligible mares must be recorded and numbered before their progeny may be recorded.

Fees for Registration.

	To Members.	To Non-Members.
Each animal	\$2.00	\$4.00
Transfer of Ownership..	1.00	2.00
Duplicate certificates ..	1.00	2.00
New certificate	1.00	1.00
Recording ancestors ...	1.00	1.00

Shire.

Animals recorded in the English Shire Horse Stud Book, or in the American Shire Horse Stud Book, in which case all ancestors back to and including those imported from Great Britain, must be recorded. All animals, the sires and dams of which are recorded in the Canadian Shire Horse Stud Book.

Fees for Registration.

	To Members.	To Non-Members.
Animals under three years	\$1.00	\$2.00
Animals over three years	2.00	4.00
Transfer of ownership..	.50	.50
Duplicate certificate ..	.50	.50
New certificate .....	.50	.50
Tabulated Pedigree ...	2.00	2.00

Percheron.

Animals recorded in the Stud Book Percheron de France, or in the American Percheron Stud Book, if, on investigation their pedigrees are found to be correct and proper, and the progeny born in Canada of animals already registered in the Canadian Percheron Stud Book.

Fees for imported animals the same, but the rates are calculated on whether they are recorded before or after one year of date of importation.

Fees for Registration of Canadian or American Bred Animals.

	To Members.	To Non-Members.
Males, when recorded before Sept. 1st of the		

year following year of foaling	\$3.00	\$5.00
Females, when recorded before Sept. 1st of the year following year of foaling	1.00	2.00
Males, if recorded after Sept. 1st of year following year of foaling	4.00	6.00
Females, if recorded after Sept. 1st of year following year of foaling	2.00	4.00
Transfers .....	.50	.50
Duplicate certificates ..	.50	.50
New Certificates .....	.50	.50

Thoroughbred.

Animals recorded in the General Stud Book (Great Britain), American, French, Belgian or Australian

Stud Books, and the progeny born in Canada from sires and dams registered in the Canadian Thoroughbred Stud Book.



Points of Draught Horse.
Explanation of Parts.

1. Ear.
2. Forehead.
3. Eye.
4. Nostril.
5. Lip.
6. Angle of Lower Jaw.
7. Throat.
8. Poll.
9. Neck.
10. Withers.
11. Back and Loins.
12. Loins.
13. Point of Hip.
14. Croup.
15. Haunch.
16. Stifle Joint.
17. Gaskin.
18. Point of Hock.
19. Hock Joint.
20. Hind Canon.
21. Fetlock Joint.
22. Pastern Joint.
23. Pastern.
24. Hind Foot.
25. Chest.
26. Breast.
27. Shoulder.
28. Shoulder Joint.
29. The Arm.
30. Point of Elbow.
31. Forearm.
32. Knee Joint.
33. Fore Canon.
34. Fetlock Joint.
35. Pastern Joint.
36. Pastern.
37. Foot.

Fees for Registration	To To Non-		Fees for Registration of Canadian Bred Animals	To To Non-	
	Members	Members		Members	Members
Each registration, if animal is canadian bred and recorded in America.....	1.50	2.00	Each registration if animal is recorded in the year in which it is foaled.....	\$ 1.00	\$ 2.00
Trotting, register prior to May 1st, 1910.....	1.00	2.00	Each registration if animal is recorded after the 31st of December of the year of foaling.....	5.00	10.00
Transfers.....	.50	1.00	Transfer or Duplicate Certificate.....	1.00	2.00
Duplicate or New Certificate.....	.50	1.00	Animals foaled out of Canada—each registration.....	2.00	4.00

Belgian

Animals recorded in the Stud Book des Cheveaux de Traits Belges, or in the American Register of Belgian Draft Horses. Progeny born in Canada of sires and dams registered in the Canadian Belgian Draft Stud Book.

Fees for Registration

	To Members	To Non-Members
Stallions.....	\$ 3.00	\$ 4.00
Mares.....	1.00	2.00
Transfer or Duplicate Certificate.....	.50	.50

French-Canadian

Animals, the sires and dams of which are recorded in the Canadian National Records for French-Canadian Horses.

Fees for Registration:

To members	\$1.00
To non-members	3.00

Transfers:

To members .....	.25
To non-members .....	.50
Copy of Certificate of Registration:	
To members .....	.25
To non-members .....	.50
Annual Membership Fee.....	1.00

Standard-Bred

Animals recorded as Standard Bred in the American Trotting Register (Chicago), or the produce of sires and dams recorded in the Canadian Standard Bred Stud Book:

Fees for Membership.

Life membership	\$25.00
Annual membership	2.00

Registration Fees.

Members, including certificate..	\$1.50
Non-members, including certificate	3.00

Transfers.

To members .....	.50
To non-members	\$1.00

Duplicate Certificates.

Members .....	.50
Non-members	\$1.00

RULES OF ENTRY.

The following animals may be admitted to Registry:—

Trotting Standard.

1. (1) An animal recorded as Standard in the American Trotting Register under the rules governing the Trotting Division.

(2) An animal whose sire and dam are recorded as Standard in the American Trotting Register under the rules governing the Trotting Division.

(3) An animal whose sire and dam are recorded in the Trotting Division

of the Canadian Standard Bred Stud Book.

(4) A mare sired by a registered Standard Trotting Horse providing her first, second and third dams are each sired by a registered Standard Trotting Horse.

Pacing Standard.

(1) An animal recorded as Standard in the American Trotting Register under the rules governing Pacing Division.

(2) An animal whose sire and dam are recorded as Standard in the American Trotting Register under the rules governing the Pacing Division.

(3) An animal whose sire and dam are recorded in the Pacing Division of the Canadian Standard Bred Stud Book.

(4) A mare sired by a registered Standard Pacing Horse providing her first, second and third dams are each sired by a registered Standard Pacing Horse.

(5) The progeny of a registered Standard Trotting Horse out of a registered Standard Pacing mare or the progeny of a registered Standard Pacing Horse out of a registered Standard Trotting mare.

3. Every application for registration must be made on a blank which will be furnished free for the purpose, and must state sex, color and markings, name, date of birth, name and registration number of the sire and of the dam. Applications must be signed by the breeder if the animal was foaled his property. If the dam was sold after being bred, the person owning her when the foal was born must sign the application, but transfer of the dam is necessary before owner's signature will be accepted, and in addition, the owner of the sire must certify to service on the transfer application.

Application for registration under rule 4 of either the Trotting or Pacing Division, must state (a) name and registration number of the sire; (b) names and registration numbers of the sires of the first, second and third dams; (c) the breeders of the first, second and third dams, and must be sworn to or affirmed before an officer authorized to administer oaths.

The owner of the sire of an animal offered for entry, must certify to service. Signature will not be accepted unless such ownership appears on the

books of the Canadian Standard Bred Horse Society. This signature is not required where the animal is already on record in another book.

When applying for registration of imported animals the foreign certificate of registration must be forwarded in addition to the usual applications. For registration of animals imported in dam certificates of service must be supplied certified by the owner of the service stallion.

When an animal is a twin it shall be so stated when applying for registration, and the sex given of the animal with which it is a twin. Should a twin be entered upon the record without such statement, no subsequent application for entry of animal twin with the same will be accepted.

4. The breeder of an animal is the owner of the dam at the time she was bred. The first owner is the owner of the dam at the time the colt was foaled.

6. In case of change of ownership of an animal the seller must make the transfer of ownership on the books of the Canadian Standard Bred Horse Society. The certificate of registration must be forwarded to the Record Office with an application for transfer made on the form supplied. Transfer will be endorsed on the back of the certificate. If the application is for a female, and she is in foal, the owner of the service stallion or his authorized agent must certify to service.

When the pedigree of an animal may have been admitted or ownership transferred through misrepresentation or fraud, the Board of Directors shall, on the discovery of the same, declare the entry or transfer void, together with any entries or transfers of descendants of such animal, and subsequent application for entry or transfer dependent on the signature of any person implicated in such fraud shall be refused.

In making application for registration of animals, it is understood that the pedigree is to be accepted only on condition that the given particulars are correct, and that if it should be ascertained previous to the publication of the succeeding volume, that these particulars are in any way incorrect, the Canadian Standard Bred Horse Society may, at its discretion, omit the pedigree or publish it in an

altered form. It is further understood that should the pedigree be published in the Canadian Standard Bred Stud Book prior to the discovery of an error, the Society may cancel the entry and publish the correction in such form as the Executive Committee may determine. It is further understood that the Canadian Standard Bred Horse Society will not be held responsible for any loss or damage that may be sustained through inaccuracy, omission, alteration or cancellation of an entry.

9. Duplicate names must be avoided. To this end the right is reserved to change any name when necessary, preserving, however, as far as practicable some characteristic of the name given in the application. The word "Young" shall not be used in connection with a name unless the pedigree has been previously so recorded in another book.

10. No duplicate certificate will be issued unless a Statutory Declaration is furnished setting forth reason why such certificate is required.

French Coach

1. (a) Animals imported from France and recorded in the Stud Book Francals Registre des Chevaux de Demi-Sang.

(b) Animals recorded in the French Coach Horse Stud Book of America or in the French Coach Horse Register, if upon investigation the pedigree is found to be correct and proper.

(c) Animals the sires and dams of which are recorded in the Canadian French Coach Horse Stud Book.

(d) The ancestry of all animals previously recorded in the French Coach Horse Stud Book of America or in the French Coach Horse Register must be recorded back to and including ancestors imported from France.

(e) Applications for recording pedigrees of imported animals must state date of importation, name of vessel and port of entry.

Fees for Registration

For animals recorded before

September 1st of the year following the year of foaling:		
Stallions.....	\$ 3.00	\$ 5.00
Mares.....	1.00	2.00

If recorded after September of the year following year of foaling:		
Stallions.....	4.00	6.00
Mares.....	2.00	4.00

For animals imported from France, if recorded within a year of the date of importation:		
Stallions.....	3.00	5.00
Mares.....	1.00	2.00

If recorded more than a year after date of importation:		
Stallions.....	4.00	6.00
Mares.....	2.00	4.00
Transfers.....	.50	.50
Duplicate Certificates.....	.50	.50

New Certificates replacing Certificates of which shipping vouchers have been used.....	.50	.50
Life Membership.....	20.00	20.00
Annual Membership.....	2.00	2.00

BOOKS ON THE ORCHARD

The Principles of Fruit Growing. By L. H. Bailey. Illustrated	\$1.50
The Pruning Book. By L. H. Bailey. Illustrated	1.50
The Spraying of Plants. By E. G. Lodeman	1.25
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(Send for descriptive catalogue.)

Suffolk

(a) Stallions or mares recorded in the English Suffolk Stud Book.

(b) Stallions or mares recorded in the American Suffolk Horse Stud Book, in which case all ancestors back to and including ancestors imported from Great Britain, must also be recorded.

(c) Animals the sires and dams of which are recorded in the Canadian Suffolk Horse Stud Book.

Fees for Registration for Canadian Bred Horses

Animals if recorded before

December 31st of the year of foaling.....	\$ 1.00	\$ 2.00
Animals if recorded after December 31st of the year of foaling.....	2.00	4.00
Transfers.....	.50	.50
Duplicate Certificates.....	.50	.50
New certificates replacing old ones of which shipping vouchers have been used.....	.50	.50
Tabulated Pedigrees.....	2.00	2.00

Fees for Registration for Imported Horses

	To Members	To Non-Members
Males.....	\$ 3.00	4.00
Females.....	2.00	3.00

Ponies**Shetland Ponies**

(a) Animals imported from Great Britain and recorded in the Shetland Stud Book of Scotland, or in the Shetland Islands Pony Stud Book.

(b) Animals, whose sires and dams are recorded in the Shetland Section of the Canadian Pony Stud Book.

(c) Animals recorded in the American Shetland Pony Club Stud Book.

(d) Animals imported from Great Britain prior to January 1st, 1909, not recorded in the Shetland Stud Book of Scotland, or in the Shetland Islands Pony Stud Book, will, on passing inspection, be recorded as foundation stock.

(e) Animals descended from known ancestors, not recorded in the Shetland Stud Book of Scotland or in the Shetland Islands Pony Stud Book, imported prior to January 1st, 1909, will, on passing inspection, be recorded as foundation stock.

Welsh Ponies

(a) Animals imported from Great Britain and recorded in the Welsh Pony and Cob Society Stud Book.

(b) Animals the sires and dams of which are recorded in the Welsh Section of the Canadian Pony Stud Book.

(c) Animals recorded in the Am-

erican Welsh Pony and Cob Stud Book.

(d) Animals imported from Great Britain prior to January 1st, 1909, not recorded in the Welsh Pony and Cob Stud Book, will on passing inspection, be recorded as foundation stock.

(e) Animals descended from known ancestors not recorded in the Welsh Pony and Cob Stud Book, imported from Great Britain prior to January 1st, 1909, will, on passing inspection, be recorded as foundation stock.

New Forest Ponies.

(a) Animals imported from Great Britain, bred by reputable breeders—a certificate to this effect must be provided by the Secretary of the English "Society for the Improvement of the Breed of New Forest Ponies."

(b) Animals the sires and dams of which are recorded in the New Forest Section of the Canadian Pony Stud Book.

Polo and Riding Ponies

(a) Animals imported from Great Britain and recorded in the Polo and Riding Pony Society's Stud Book.

(b) Animals, the sires and dams of which are recorded in the Polo and Riding Section of the Canadian Pony Stud Book.

Exmoor Ponies

(a) Animals imported from Great Britain, bred by reputable breeders.

A certificate of breeding signed by the breeder must accompany the application for entry. Name of vessel on which imported, and port of entry, must be given.

(b) Animals, the sires and dams of which are recorded in the Exmoor Section of the Canadian Pony Stud Book.

Hackney Ponies (Standard 14.1)**Bred in Canada.**

(a) Stallions with three top crosses of sires recorded in either the Canadian Pony Stud Book or the Canadian Hackney Stud Book.

(b) Mares with two top crosses of sires recorded in either the Canadian Pony Stud Book or the Canadian Hackney Stud Book.

(c) Pony stallions or mares recorded in the Canadian or American Hackney Stud Book.

(d) Stallions or mares by sires and out of dams recorded in the Canadian Pony Stud Book.

Bred in Great Britain.

2. Bred in Great Britain or Ireland and recorded in the English Hackney Stud Book.

(a) Stallions with three top crosses of *full registered sires and with two registered dams.

(b) Mares with two top crosses or *full registered sires and with one registered dam.

(c) Mares with one top cross of *full registered sires with a registered inspected dam.

*Full registered sires are those (a) that are recorded as such in any of the first sixteen volumes of the English Hackney Stud Book, or (b) those recorded since volume 16, providing they were eligible to full registration under the rules in force for entries in volume 16 of the English Hackney Stud Book.

Fees for Registration

	To Members	To Non-Members
Pedigrees of animals, under two years of age.....	\$ 1.00	\$ 2.00
Pedigrees of animals over two years of age.....	2.00	4.00
Transfers and Duplicate Certificates.....	.50	.50

Cattle**Shorthorn**

Animals that trace in all their crosses to imported animals registered in the Ayrshire Cattle Herd Book Society of Great Britain and Ireland. Registrations in the Ayrshire Cattle Herd Book Society of Great Britain and Ireland of stock imported previous to 1899 will not be required; those imported in, or after 1899 must trace to ancestry distinctly designated; but, owing to the difficulty in keeping proper records prior to that date, it will be sufficient to know that the ancestry has been imported. Before the pedigrees of the Canadian-bred animals are eligible for registration in the Canadian Ayrshire Herd Book, their sires and dams back to and including the imported

animals must be recorded.

Fees for Registration

	To Members	To Non-Members
Animals under 24 months old.....	\$ 1.00	\$ 1.50
Animals over 24 months old.....	2.00	3.00
Transfers.....	.25	.25
Duplicate Certificates....	.25	.25
Transfer and Duplicate (combined).....	.50	.50
New certificates replacing Certificate of which shipping vouchers have been used.....	.25	.25

Ayrshire

1. (a) Animals that trace in all their crosses to ancestors registered or eligible for registration in the 40th or preceding volumes of the

English Shorthorn Herd Book. Provided that in the case of animals imported since 1865, registration in the English Herd Book will be required. Those imported prior to 1865 must trace to ancestry distinctly designated. (b) Animals the sires and dams of which are recorded in the Dominion Shorthorn Herd Book. (c) Animals the sires and dams of which are recorded in the American Shorthorn Herd Book, providing such sires and dams trace in all their crosses as indicated in clause (a) of this section. All ancestors back to and including the imported ones must be recorded in the Dominion Shorthorn Herd Book, for which a fee of 50 cents each is charged.

Fees for Registration

	To Members	To Non- Members
Females under two years of age.....	\$ 1.00	\$ 2.00
Females over two years of age.....	2.00	4.00
Males under two years of age.....	2.00	4.00
Males over two years of age.....	4.00	8.00
Transfers, if made within 90 days of date of sale..	.50	1.00
Transfers, if made after 90 days of date of sale.....	1.00	2.00
Duplicate Certificates.....	.25	.50
Old form Certificates exchanged for National Certificates.....	.25	.25
Special extended Certificates.....	.75	1.00
For recording pedigrees of imported cattle.....	1.00	2.00
For recording pedigrees of cattle entered in American Ayrshire Herd Book	1.00	2.00
For recording pedigrees of ancestors to complete pedigrees of animals owned by applicant.....	1.00	1.00
For recording pedigrees of ancestors to complete pedigrees of animals not owned by applicant.....	.25	.25
Registration of Farm Names.....	1.00	1.00
This registration gives exclusive use of name registered.		

Hereford

No pedigree is eligible for regis-

tration in the Canadian Hereford Breeders' Association Herd Book unless it traces on side of both sire and dam to stock recorded in the American Hereford Herd Book or imported stock from Great Britain, and if imported since 1889, must be recorded in the English Herd Book.

Fees for Registration

	Membership, \$2.00 for the Calendar year.	To Members	To Non- Members
Animals under two years of age.....	\$.75	\$ 2.00	
Animals over two years of age.....	2.00	4.00	
Transfers.....	.25	.50	
Duplicate Certificates.....	.25	.50	
Old form Certificates exchanged for National Certificates.....	.25	.25	
Special Extended Certificates.....	1.00	2.00	
For recording pedigrees of imported cattle.....	.75	2.00	
For recording pedigrees of cattle entered in American Hereford Record...	.75	2.00	
For recording pedigrees of ancestors to complete Canadian Registrations to residents of the United States, back to and including the imported animal.....	.75	2.00	
For recording pedigrees of ancestors to residents of Canada, back to and including the imported animal.....	.50	.50	

Jersey

Animals imported from the Island of Jersey.

Animals imported from Great Britain or Ireland recorded in the English Jersey Herd Book, in which case they must trace in all their crosses to ancestors recorded in the Island of Jersey Herd Book.

3. Animals recorded in the American Jersey Cattle Club Herd Register.

4. Animals, the sires and dams of which are recorded in the Canadian Jersey Cattle Club Herd Book.

5. Animals recorded in the New Brunswick or Nova Scotia Herd Books, providing such animals trace in all their crosses to animals re-

corded in the Island of Jersey Herd Book or the American Jersey Cattle Club Herd Register.

6. Applications for registration of animals recorded in the American Jersey Cattle Club Herd Register must be accompanied by American Certificates showing applicant's ownership.

7. Application for registration of animals imported from the Island of Jersey or from Great Britain and Ireland must be made on application forms for imported animals.

Fees for Registration for Canadian-Bred Animals

	To Members	To Non-Members
Animals under 2 years of age.....	\$ 1.00	\$ 1.50
Animals over 2 years of age.....	1.50	2.00
Transfers, if made within 90 days of date of sale..	free	
Transfers if made after 90 days of date of sale.....	.25	.50
Duplicate Certificates.....	.25	.25
Animals Imported from the Island of Jersey or Great Britain.		
	To Members	To Non-Members
.....	\$ 1.00	\$ 2.00
Animals Entered in the American Jersey Cattle Club Register		
	To Members	To Non-Members
.....	\$ 1.00	\$ 2.00
Animals Recorded in the Nova Scotia or New Brunswick Herd Books		
No charge.		

Galloway

(a) Animals imported from Great Britain and recorded in the Galloway Herd Book of Great Britain.

(b) Animals the sires and dams of which are recorded in the American Galloway Herd Book, in which case all ancestors back to and including the imported cross must be recorded.

(c) Animals the sires and dams of which are recorded in the North American Galloway Herd Book.

Fees for Registration.

	To Members	To Non-Members
Animals under six months of age	\$.50	\$ 1.00

Animals over six months of age	1.00	1.50
Transfers .....	.25	.25
Duplicate Certificates	.25	.25

Aberdeen Angus

Animals recorded in the Aberdeen Angus Herd Book (Scotland) or in the American Aberdeen Angus Breeders' Association Herd Book, Canadian bred animals whose sire and dam are registered in the Canadian Aberdeen Angus Herd Book. Males, red in color, or with a noticeable amount of pure white above the underline or on the leg or legs or with scurs shall not be recorded.

No animal over two years of age will be accepted for registration in the Canadian Aberdeen Angus Herd Book, unless previously recorded in the Aberdeen Angus Herd Book (Scotland), or in the American Aberdeen Angus Association Herd Book.

Fees for Registration.

	To Members	To Non-Members
Animals under one year	\$ 1.00	\$ 2.00
Animals over one year and under two	3.00	5.00
Transfer presented for record within 90 days of date of sale .....	.25	.25
Transfer presented for record after 90 days from date of sale..	1.00	1.00
Duplicate Certificates	1.00	1.00

Guernsey

All animals must be imported or must be traceable through both sire and dam to animals imported from the Island of Guernsey. All imported animals before being eligible for entry must be registered in the Herd Book of the Royal Guernsey Agricultural Society, the General Herd Book of Guernsey, or the Herd Book of the English Guernsey Cattle Society. In order to secure the entry of imported animals one of our regular application blanks must be filled out and certified to by the Secretary of the Island or English Herd Book in which the animal is registered, and sent by him under seal to the Registrar of the Canadian Guernsey Breeders' Association. In the case of Cana-

dian bred animals the sire and dam of each must be registered before the animal can be. Animals recorded in the American Guernsey Cattle Club Herd Register may be re-registered at a nominal fee of fifty cents per head.

Fees for Registration

	To Members	To Non-Members
For animals owned and entered	\$ 1.00	\$ 2.00
For re-registration of animals recorded in the American Guernsey Cattle Register	1.00	1.00
Transfer Certificates in all cases .....	.25	.25

French-Canadian

An animal, the dam and sire of which are recorded.

Colour for Cows.—The colour for cows may be black or brown, or dark brown, with or without a yellow stripe along the back and around the muzzle, or a gray stripe around the muzzle. The colour may also be fawn or brindle.

Colour for Bulls.—The colour for bulls may be black or brown, or dark brown, with or without a yellow stripe along the back and around the muzzle, or a gray stripe around the muzzle.

Registration should not be refused if females have a little white under the belly, on the forehead or in the switch, nor to bulls having a little white under the belly, or in the switch.

The horns must be all white or all black, white with black tips, or black with white tips.

FEES FOR REGISTRATION

	To members	To non-members
1. If an animal is accepted before the 31st December of the year of birth.....	\$0.50	\$1 00
2. If an animal is accepted before the 31st December of the year following the year of birth.....	1.00	2.00
3. If an animal is accepted before the 31st December of the second year following the year of birth.....	2.00	4.00
4. If an animal is accepted before the 31st December of the third year following the year of birth.....	3.00	6.00
5. If an animal is accepted after the 31st December of the third year following the year of birth.....	4.00	8.00

TRANSFERS

.....	0.25	0.50
-------	------	------

DUPLICATE CERTIFICATES

.....	0.25	0.50
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Red Polled

Animals imported from Great Britain recorded in the Red Polled Herd Book.

Animals recorded in the American Red Polled Herd Book, in which case all ancestors back to and including those imported from Great Britain must also be recorded in the Canadian Book.

Animals whose sires and dams are recorded in the Canadian Red Polled Herd Book.

The color shall be red, the switch of the tail should be mixed with white, a portion of the udder may be white, and also a little white on the belly along the milk veins. Any animal with any additional white, or with horns, scurs, or abortive horns shall not be recorded for breeding purposes.

Fees for Registration

	To Members	To Non-Members
Each registration.....	\$ 1.00	\$ 2.00

Transfers of ownership....	.25	.25
Duplicate Certificates.....	.25	.25
Registration of ancestors to complete pedigrees.....	.25	.25

Holstein-Friesian.

Sec. 4.—Pure bred Holstein-Friesian may be held to mean and refer only to those large improved black and white cattle already registered in the Holstein, Dutch-Friesian and Holstein-Friesian Herd Books, such as are descended from them in direct line, both as to sire and dam, and such imported animals, or their descendants as are registered in the Netherlands, Friesian, or North Holland Herd Books, proved by the affirmation of breeder of the animal satisfactory to the Inspector. The color markings shall be black and white in any proportion, with the exception of switch, part of belly, and lower part of two legs or feet white. All imported animals shall be registered in the name of the importer. The applications for registry of animals imported in dam must be signed by the importer. No imported animal shipped from Europe after February 6th, 1894, shall be eligible for registry in the Herd Book unless the animal or its dam and sire are registered in the Netherlands, Friesian, or North Holland Herd Books. All applications for registry of animals imported from the United States must be accompanied by a form of application with

markings sketched and described, signed by the breeder or owner, also by the certificates of registry and transfer in the Holstein-Friesian Herd Book, or the Wetsern Holstein-Friesian Herd Book. All animals must be registered in the Canadian Herd Book before their offspring can be registered.

Article VIII.—Fees.

Membership fee	\$5.00
Annual due, to be paid 1st of February	1.00
Registration for members	1.00
Registration for non-members..	2.00
Registration for members (ani- mals over one year of age)...	2.00
Registration for non-members (animals over one year of age)	4.00
Transfers (members) .....	.25
Transfers (non-members) .....	.50
Transfers after ninety days af- ter sale .....	.75
Transferring Canadian-bred ani- mals from American to Cana- dian Herd Book .....	.25
Registration of animals import- ed since Feb. 1, 1902, and pre- vious to March 1, 1909, bulls.	10.00
Registration of animals import- ed since Feb. 1, 1902, and pre- vious to March 1, 1909, cows.	5.00
Import Certificate, bulls	25.00
Import Certificate, cows	10.00
Registration Certificate of new form .....	.10
Duplicate Certificate .....	.50
Registration of Farm Name ..	1.00

Swine

The Dominion Swine Breeders' Association have established records for the following breeds: Yorkshire, Berkshire, Tamworth, Essex, Poland China, Chester White, Duroc Jersey, and Hamshire. Animals recorded as below and their progeny, tracing through both sire and dam, are eligible for registration:

Berkshire

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the British Berkshire Herd Book.

(c) Animals recorded in the American Berkshire Record, in which case all ancestors back to and including ancestors imported from Great Britain must be recorded.

Yorkshire

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the Large White Section of the English National Pig Breeders' Association Herd Book.

(c) Animals recorded in the American Yorkshire Record, in which case all ancestors back to and in-

cluding ancestors imported from Great Britain, must be recorded.

Tamworth

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the Tamworth Section of the English National Pig Breeders' Association Herd Book.

(c) Animals recorded in the American Tamworth Swine Record, in which case all ancestors back to and including ancestors imported from Great Britain must be recorded.

Essex

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals imported from Great Britain bred by reputable breeders.

(c) Animals recorded in the American Essex Swine Record.

Poland-China

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the following United States Poland China Records: America, National, South-western or Standard.

Chester White

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the O.I.C. Record (United States).

Durox Jersey

(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the American Duroc Jersey Record or in the National Duroc Jersey Record.

Hampshire

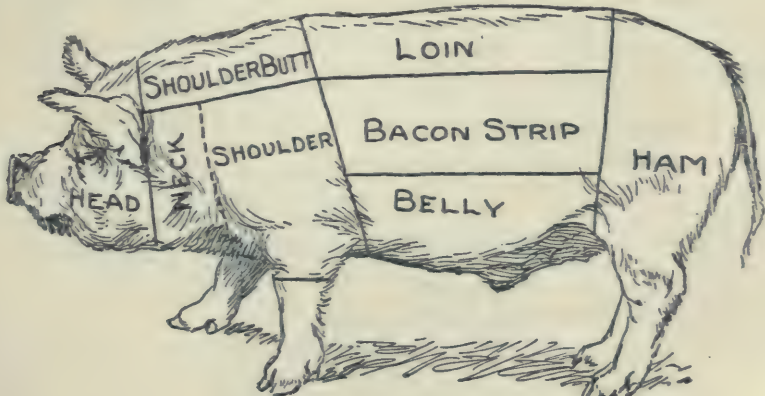
(a) Animals the sires and dams of which are recorded in the Dominion Swine Breeders' Record.

(b) Animals recorded in the American Hampshire Record.

Fees for Registration.

	To Members.	To Non-Members.
Each registration	\$1.00	\$1.00
Transfer of ownership ..	.25	.25
Duplicate Certificates...	.25	.25

Utilizing Pork. Head: Head-cheese, sausage, bean pork; Shoulder Butt: Roast, steak, butt-fat; Shoulder: Steak, picnic ham, roast; Loin: Fat back, tenderloin, roast, chops; Bacon Strip: Bacon, salt pork; Belly: Salt pork; Ham: Cured ham, steak; Feet: Pickled pig's feet.



Cuts of Pork.

Sheep

Records have been established by the Dominion Sheep Breeders' Association for the following breeds: Lincoln, Shropshire, Oxford Down, Cotswold, Dorset, Southdown, Hampshire, Leicester, Highland Blackface, Cheviot and Suffolk.

Shropshire

(a) Animals imported from Great Britain, recorded in the English Flock Book of Shropshire Sheep.

(b) Animals whose sires and dams are recorded in the Shropshire Division of the Canadian National Records or in the American Shropshire Sheep Record.

Leicester

(a) Animals whose sires and dams are recorded in the Flock Book of Great Britain.

(b) Animals whose sires and dams are recorded in the Leicester Division of the Canadian National Records, or in the American Leicester Breeders' Association Record, or in any Record taken over by the Canadian National Records.

Cotswold

(a) Animals imported from Great Britain, recorded in the English Cotswold Flock Book.

(b) Animals whose sires and dams are recorded in the Cotswold Division of the Canadian National Records, or in the American Cotswold Registry.

Oxford Down

(a) Animals imported from Great Britain, recorded in the English Oxford Down Flock Book.

(b) Animals whose sires and dams are recorded in the Oxford Down Division of the Canadian National Records or in the American Oxford Down Record.

Lincoln

(a) Sheep imported from Great

Britain, recorded in the English Lincoln Flock Book.

(b) Animals whose sires and dams are recorded in the Lincoln Division of the Canadian National Records, or in the National Lincoln Sheep Breeders' Record.

Dorset Horn

(a) Animals imported from Great Britain, recorded in the English Dorset Horn Sheep Breeders' Association Flock Book.

(b) Animals whose sires and dams are recorded in the Dorset Division of the Canadian National Records, or in the Continental Dorset Club Record.

Suffolk

(a) Animals imported from Great Britain, recorded in the English Suffolk Flock Book.

(b) Animals whose sires and dams are recorded in the Suffolk Division of the Canadian National Records, or in the American Suffolk Sheep Record.

Hampshire Down

(a) Animals imported from Great Britain, recorded in the English Hampshire Down Flock Book.

(b) Animals whose sires and dams are recorded in the Hampshire Division of the Canadian National Records, or in the American Flock Record of Hampshire Down Sheep.

Southdown

(a) Animals bred in Great Britain and Ireland, and recorded and numbered in the Southdown Flock Book of England, provided their sires and dams are also numbered and recorded in said Flock Book.

(b) Animals owned in, or imported from Great Britain and Ireland, not entered in the Southdown Flock Book of England, may be recorded as provided in clause (c).

(c) Animals bred in America and

tracing in all their crosses to flocks of reputable breeders in Great Britain and Ireland, or to those already recorded, provided their sires and dams and grand sires and grand dams are eligible, and are also recorded in the Southdown Division of the Canadian National Records.

(d) Animals that are immediate descendants of those recorded in the Southdown Division of the Canadian National Records, or in the American Southdown Record.

Cheviot

(a) Animals imported from Great Britain and recorded in the Cheviot Sheep Flock Book.

(b) Animals whose sires and dams are recorded in the Cheviot Division of the Canadian National Records, or in the American Cheviot Flock Book.

Blackface

(a) Animals imported from Great

Britain from flocks recognized as being pure bred. A certificate to this effect must be furnished signed by the Secretary of the Blackface Sheep Breeders' Association (Scotland).

(b) Animals whose sires and dams are recorded in the Blackface Division of the Canadian National Records.

2. Application for registration must be made upon blanks which will be furnished free.

Fees for Registration

	To Members	To Non-Members
If animals are recorded before the first of December of the next year following the year of birth.	\$.50	\$ 1.00
If animals are recorded after the time limit fixed	1.00	1.00
Transfers.....	.25	.25
Transfers which may be necessitated by a change in a firm name where no consideration passes.....	Free	
Duplicate Certificates.....	.10	.10

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TORONTO

The age of the horse is an important factor in determining his present and prospective value. Familiarity with the characters which most certainly indicate age are, therefore, often extremely useful. A knowledge of these characters is not difficult to secure, but skill in their application depends much on familiarity and continued practice.

General Considerations

In estimating the age of the horse, the teeth furnish the best index. Yet there are other general considerations that play an important part, especially in the case of young and very old animals. In very old horses, white hairs make their appearance around the temple, the eyes, the nostrils and elsewhere; the poll, or top of the head, becomes more pointed, the sides of the face more depressed, and the hollows above the eyes more marked. Bear in mind these considerations are general, and must be considered as a whole; each, alone, is of very little or no use.

While differences in the appearance of the teeth are considered the most important and the most accurate means of estimating the age of domestic animals, and are the means employed by all horsemen, yet these are not absolutely accurate, and much depends on conditions as well as on the individuality of the animal. The teeth of horses that have bones of somewhat open structure are likely to indicate that the animals are somewhat older than they are; while the teeth of horses whose bones are of fine, close texture, may indicate them to be younger than they are. Again, a horse which has always been fed on soft, succulent food is likely to show a young mouth; whereas, one fed on hard, dry food is likely to show an older mouth. Thus it is apparent that the texture of the bones, the breeding, the kind of food the horse has eaten, and other conditions, have more or less influence on the teeth.

The horse, when full-grown, has

forty teeth, twenty on either jaw, divided as follows: Six incisors, two canines (one on either side), and twelve molars (six on either side). Since only the incisor, or nipper, teeth are inspected in estimating the age, they alone will be considered. It is the order in which they make their appearance that enables us to estimate the age up to five years, and the manner in which their surface is worn that aids us in the estimation up to eight years of age. After the horse has passed the eighth year, it is sometimes difficult to determine his true age by the teeth.

It is not often that one is obliged to inspect the teeth of a horse under three years of age in order to make an estimate of its age. Therefore, the period of colthood will be passed over and we will consider the condition of the incisors when the horse has reached the age of two and one-half to three years.

Two and One-half to Three Years Old.

At about two years and nine months to two years and eleven months the central permanent incisors will appear, and at three years of age the outer part of the teeth, and sometimes the inner also, will be up and in wear. The permanent incisors are larger in every way than the temporary or milk teeth; they are also less smooth and regular, and are usually darker colored, so that no difficulty is experienced in distinguishing the permanent from the temporary incisors.

Four Years Old.

At about three years and nine months, the intermediate incisors appear. At four years of age, they are fully up and in wear on the outside, and sometimes on the inside. The central incisors show one year's wear, and the cups are not so deep as they were when the colt was three years old. If the colt be a male the tusks should be evident. They would still be sharp and flattish on the insides.



Fig. 1.—Incisors of foal at nine weeks.

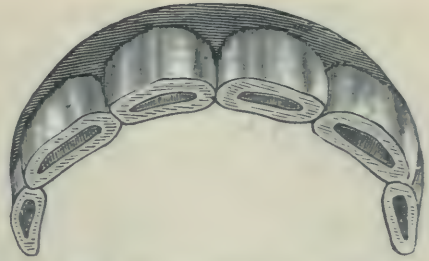


Fig. 2.—Incisors at one year.

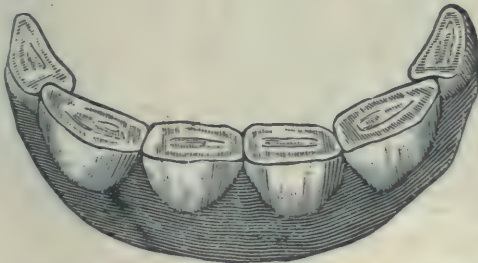


Fig. 3.—Incisors at two years.

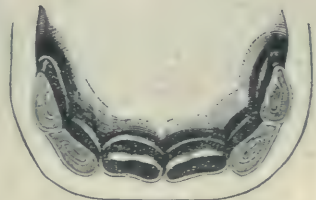


Fig. 4.—Lower pair at three years.



Fig. 5.—Lower pair at four years.

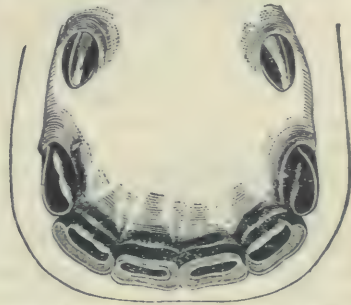


Fig. 6.—Lower pair at five years.

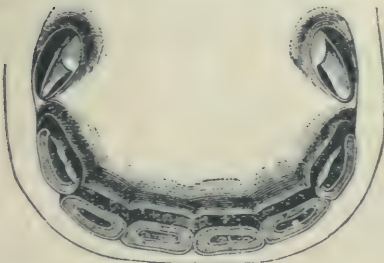


Fig. 7.—Lower pair at six years.

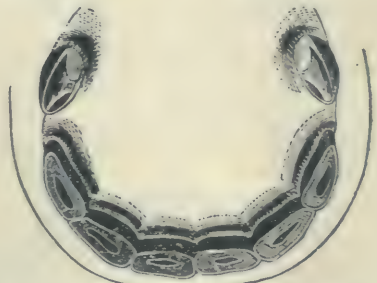


Fig. 8.—Lower pair at seven years.

Cuts Showing Teeth in Horses at Different Ages



BOLOGNA BULL.

Five Years Old.

At the age of about four years and nine months, the permanent corner incisors make their appearance. When the horse is full five years of age, the outer exterior parts meet, although almost one year of wear must take place before the lateral or corner teeth are worn level over their entire surface. The horse has now a full mouth, and the central incisors show two years' wear. The cups show on all, but are deepest and freshest in the corner teeth.

Six Years Old.

At six years the cups in the central incisors of the lower jaw have disappeared, or nearly so; have become smaller in the intermediates, and the corner teeth are worn level over their entire surface.

Seven Years Old.

At seven years of age the cups in the intermediate incisors of the lower jaw have disappeared, although small dark spots may often be seen. The corner teeth still retain their cups, although they are rather shal-

low. It is well to bear in mind that from the time when the teeth of the lower jaw are well up and in wear to the time that the cups have disappeared from the lower jaw is three years. The teeth in the upper jaw retain their cups for a much longer time; in fact, just twice as long, disappearing in six years after they have made their appearance.

Eight Years Old.

At eight years of age, the cups have disappeared from the teeth of the lower jaw. One must not be misled by the slight, dark-colored indentations that are still present, for they are not deep enough to be called cups. By the time the horse has reached this age, the shape of the teeth have undergone marked changes. (Compare Fig. 9 with Fig. 10.) In the first place, the teeth were thin from outside to inside, and comparatively broad from right to left; while, in the latter case, they are much thicker from inside to outside, and have become more triangular in shape. If viewed from the side, they will appear somewhat longer, and will meet at a sharper angle

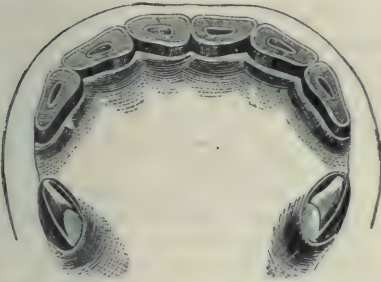


Fig. 9.—Lower pair at eight years.

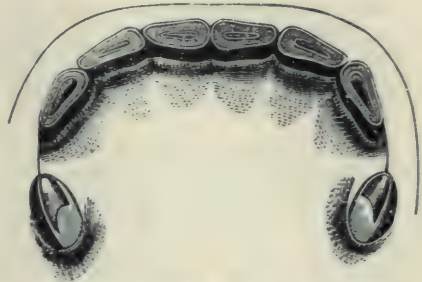


Fig. 10.—Upper jaw at 10 years.

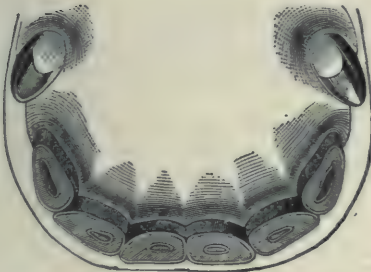


Fig. 11.—Upper jaw at 11 years.

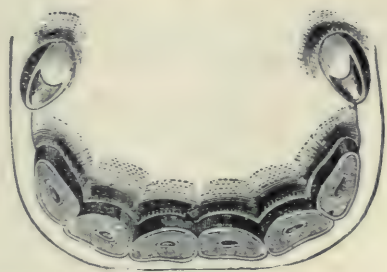


Fig. 12.—Upper jaw at 12 years.



Fig. 13.—Lower jaw at 13 years.

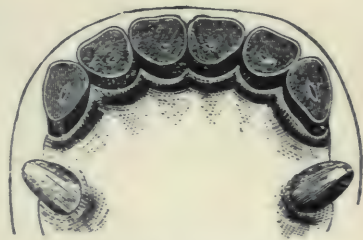


Fig. 14.—Lower jaw at 14 years.

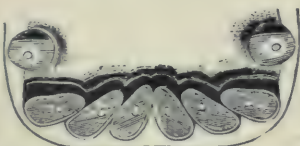


Fig. 15.—Lower jaw at 26 years.

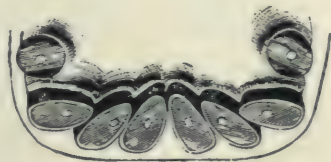


Fig. 16.—Lower jaw at 29 years.

Cuts Showing Teeth in Horses at Different Ages

than they did when the horse was younger. As the age advances, the angle formed by the teeth of the upper and lower jaw becomes more acute.

At Nine Years of Age, the cups will have disappeared from the upper central incisors; from the upper intermediates at ten years, and at eleven years the cups will have all disappeared from the upper jaw. The cups are not likely to disappear at as regular intervals in the upper jaw as they did in the lower jaw. Therefore it is not always possible to tell the age of a horse within a year or two after he has passed his eighth year.

After the horse has passed the twelfth year the matter of two or three years amounts to little. Much depends on the individuality of the animal, as some animals are worth more at eighteen than others at fourteen. One's judgment of the value of a horse at these ages should be formed on general appearances and activities rather than on age.

The Age of Cattle and Sheep.

The only reliable method of judging the age of cattle is by means of the incisor or nipping teeth. Cattle have eight temporary incisors, or sucking teeth, in the lower jaw, but none in the upper. A pad of tissue replaces the latter. The molar teeth consist of six teeth in each jaw—upper and lower—three of which (twelve in all) are temporary, or replaceable, and for convenience are spoken of as the first, second and third temporary molars, in contradistinction to those which follow, and termed the fourth, fifth and sixth permanent molars.

At a month old, most, or all, of the temporary sucking teeth are in the mouth. At six months the fourth permanent molar will be seen. At twelve months the fifth permanent molar will appear. At two years the sixth permanent molar will be well up, but shows itself in one year and nine months. At or about two years

and six months, the first and second temporary molars are shed, and replaced by permanents; so that by the time an ox is three years of age, the third molar has been replaced and a complete set of permanent molars are now in the jaws.

Most attention must be paid to the changes in the incisors, because these are so easy to note.

It is quite an easy matter to tell the difference between temporary and permanent incisor teeth. The permanents are much broader and larger and when seen side by side with the temporary ones, it is impossible to mistake one for the other. The same remarks are equally applicable to the sheep.

If a mouth is examined at one year and nine months, a pair—the central pair—of permanent incisors will be seen. These are cut at about one year and six months, so that at one year and three-quarters they are well developed. At two years and three months to two years and nine months the permanent middle incisors are well up. Cattle vary in dentition, but as a rule it is two years and nine months to three years before the lateral permanent incisors are well up. At three to three and one-half years, the corner permanent incisors usually appear, and this completes the dentition. To judge the age after this period is speculative, and only approximate at best. The incisors gradually wear away, the corner teeth showing the least signs of wear. In horned cattle the rings formed upon the horns are used as a rough means of determining the animal's age. Add two years to the total number of rings, as the first ring is not formed until after the second year.

Sheep have twenty temporary teeth, eight being incisors, or nipping, teeth, precisely the same as in the ox, and the reader must refer to these for the several designations relating thereto. The central pair of permanent incisors are cut when the animal is about one year of age, and the perfect development of these

teeth must be taken as evidence that the yearling stage has been passed by a month or two. The middle permanent incisors will usually appear when the animal is from one year and nine months to two years of age. Some latitude must be allowed, say a couple of months either way, as the rate of development, as affected by feeding and care, will affect the time at which the permanent teeth will appear. The lateral pair will usually

appear when the animal is two years of age. The average is two years and three months, with an extreme of two years and one-half. The corner incisors are usually replaced by permanents by the time the animal has reached the age of three years. When the sheep is four years of age all the incisors are up and in wear. The animal has by this time a "full mouth," and estimations as to its age after this period is reached are, of necessity, speculative.

Feeding the Horse.

In Canada, horses are fed chiefly upon hay, grass and oats, with varying quantities of corn, fodder, roots, corn, wheat, wheat bran, rye and barley. It is usual to find in any locality that the foods which are thought suitable for feeding to horses are limited in number, although these foods would exhibit a good deal of variety when the list for all localities was taken.

The customary diet of hay and oats, with the addition of greater or less quantities of such feeds as wheat bran or a small quantity of linseed oil cake meal and a few roots, may always be counted upon to give good results if fed with ordinary care and judgment. Frequently, on account of the nature of the feeds on hand or of the economy in purchasing, other feeds may be used advantageously and safely, if discretion be exercised in their selection. In choosing these foods we should remember the needs of the animal and the demands made upon its energies, hence nutritious foods should be fed during a period of hard work, and foods of a too bulky nature must be avoided if the horse is called upon to endure considerable strain within a short period of time, whether it be in drawing heavy loads or drawing a light load at a rapid pace.

A table giving the nutritive values of several of the commonest feeding stuffs is included in this chapter; for a more complete treatise, the reader would do well to consult some such

standard work of reference as Armsby's book on feeding animals, or Henry's "Feeds and Feeding."

Sudden changes of diet are always dangerous. When desirous of changing the food, do so very gradually. If a horse is accustomed to oats, a sudden change to a full meal of corn is apt to cause digestive derangement. If we merely intend to increase the quantity of the usual feed, this also must be done gradually. The quantity of food given must always be in proportion to the amount of labor to be performed. If a horse is to do a small amount of work, or rest entirely from work for a few days, see that he receives a proportionately smaller amount of feed. If this should be observed on Saturday night and Sunday, there would be fewer cases of "Monday morning sickness," such as colics and lymphangitis.

Foods should also be of a more laxative nature when the horse is to stand for some days.

Musty or Moldy Foods.—Above all things, avoid feeding musty or moldy foods. These are frequent causes of disease of different kinds. Lung trouble, such as bronchitis and "heaves," often follows the use of such food. The digestive organs always suffer from musty or moldy foods. Musty hay is generally considered to produce disorder of the kidneys; and all know of the danger to pregnant animals from feeding upon ergotized grasses or grains.

Leaving these somewhat general

considerations, brief reference may be made to the different kinds of foods:

Hay.—The best hay for horses is timothy. It should be well cured, crisp, clean, fresh, and possessing a sweet, pleasant aroma. Even this good hay, if kept for too great a length of time, loses part of its nourishment, and it becomes hard, dry and more or less indigestible. New hay is difficult to digest, and tends to produce much salivation (slobbering), and occasional purging and irritation of the skin. If obliged to feed at all, it should be given sparingly.

The average horse on grain should be allowed from 10 to 12 pounds of good hay a day. It is a mistake of many to think that horses at light work can be kept entirely on hay. Such horses soon become pot-bellied, fall off in flesh, and do not thrive. The same is true of colts; unless the latter are fed with some grain they grow up to be long, lean, gawky creatures, and never make as good horses as those accustomed to grain with, or in addition to, their hay.

Straw.—The straws are not extensively fed in this country, and when used at all, it should be in conjunction with a certain amount of hay, and the deficiency made up by a more generous ration of grain. Wheat, rye and oat straw are the ones most used, and of these oat straw is most easily digested and contains the most nourishment. Pea and bean straw are occasionally fed to horses, the pea being preferable, according to most writers.

Chaff.—Wheat and rye chaff should never be used as a food for horses. The beards frequently become lodged in the mouth or throat, and are productive of more or less serious trouble. In the stomach and intestines they often serve as the nucleus of soft concretions, which serve as obstructions in the digestive tract.

Oat chaff, if fed in small quantities and mixed with cut hay or corn fodder, is very much relished by horses.

Grains.—Oats take precedence of all grains as a food for horses, as the ingredients necessary for the complete nutrition of the body exist in them in the best proportions. Oats are, besides, more easily digested and a larger proportion absorbed and

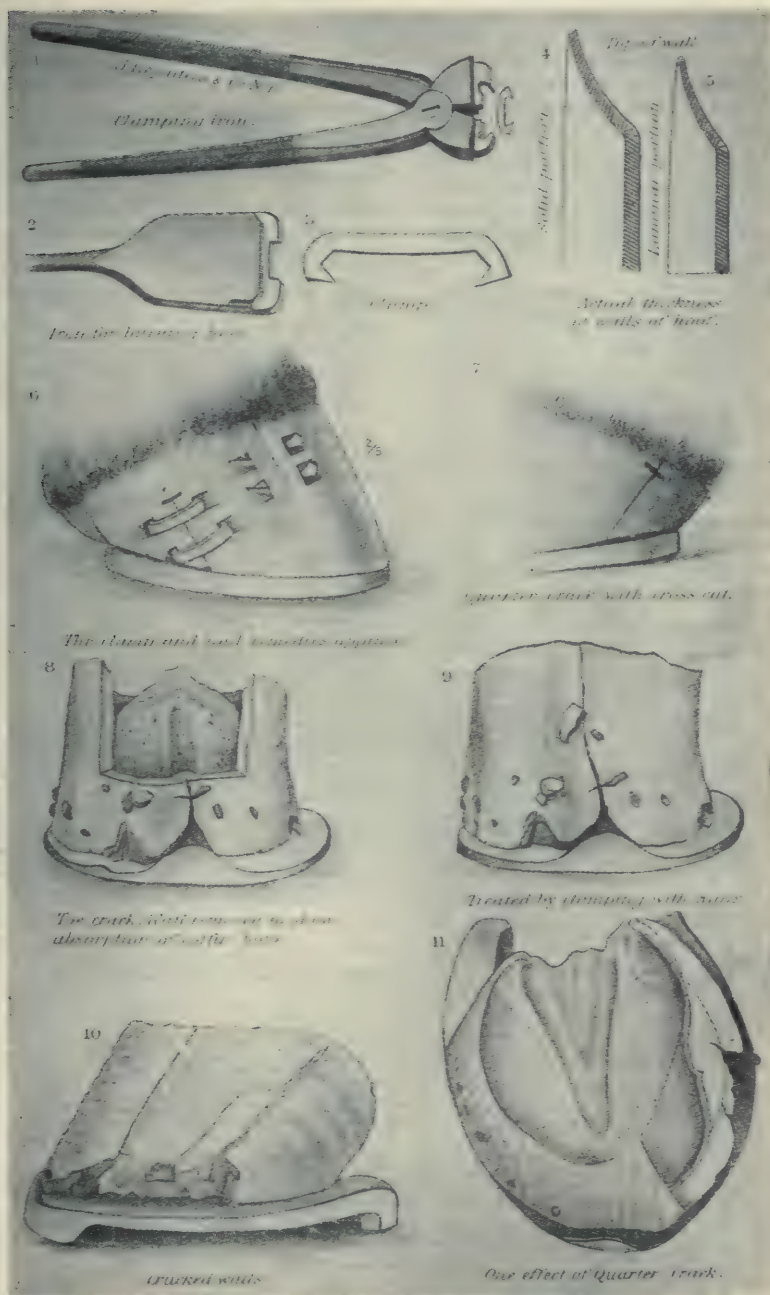
converted into the various tissues of the body. Care must be taken in selecting oats. According to Stewart, the best oats are one year old, plump, short, hard, clean, bright and sweet. New oats are thought to be indigestible. Kiln-dried oats are to be avoided as a rule, for even though originally good, the drying process injures them by rendering them less digestible. Oats that have sprouted or fermented are injurious, and should not be fed. Oats are to be given either whole or crushed—whole in the majority of instances; crushed to old horses and those having defective teeth. Horses that bolt their feed are also best to be fed upon crushed oats and out of a manger large enough to permit of spreading the grain in a thin layer.

The average horse requires, in addition to the allowance of hay above mentioned, about 12 quarts of good oats daily. Moldy oats, like hay and straw, are likely to produce serious digestive disorders.

Wheat and Rye.—These grains may be used as food for horses in small quantities, bruised or crushed, and fed mixed with other grains and hay. If fed alone, in any considerable quantities, they are very likely to produce digestive disorders—laminitis (founder) and similar troubles. They should never constitute more than one-fourth of the grain allowance, and should always be ground or crushed.

Bran.—The bran of wheat is the one most used, and its value as a feeding stuff is variously estimated. It is not to be depended upon if given alone, but may be fed with other grains. It serves to keep the bowels open. Sour bran should not be given. It disorders the stomach and intestines, and may even produce serious results.

Maize (corn).—This grain is not suitable as an exclusive food for young horses, as it is deficient in salts. It is fed whole or ground. Corn on the cob is commonly used as the food for horses affected with "lampas." If the corn is old, and is to be fed in this manner, it should be soaked in pure, clean water for ten



Quarter-Crack and Remedies.

or twelve hours. Corn is better given ground and fed in quantities of from one to two quarts at a meal, mixed with crushed oats or wheat bran. Be very particular in giving corn to a horse that is not accustomed to its use. It must be commenced in small quantities and very gradually increased. I know of no grain more likely to produce what is called acute indigestion than corn, if these directions are not observed.

Linseed.—Ground linseed is occasionally fed with other foods to keep the bowels open and to improve the condition of the skin. It is of particular service during convalescence, when the bowels are sluggish in their action. Linseed tea is very often given in irritable or inflamed conditions of the digestive organs.

Potatoes.—These are fed as an article of food for the horse in many sections. They possess, in common with other roots, slight laxative properties.

Carrots.—These make a most excellent food, particularly during sickness. They improve the appetite and slightly increase the action of the bowels and kidneys. They possess also certain alterative properties. The coat becomes smooth and glossy when carrots are fed. Some veterinary writers claim that chronic cough is cured by giving carrots for some time. The roots may be considered, then, as an adjunct to the regular regimen, and if fed in small quantities, are highly beneficial.

Grasses.—Grass is the natural food for horses. It is composed of a great variety of plants, differing widely as to the amount of nourishment contained, some being almost entirely without value as foods and only eaten when there is nothing else obtainable, while others are positively injurious or even poisonous. None of the grasses are sufficient to keep the horse in condition for work. Horses thus fed are "soft," sweat easily, purge, and soon tire on the road or when at hard work. To growing stock, grass is indispensable, and there is little or no doubt but that it acts as an alternative when given to horses accustomed to hay and grain. It must be given to such horses in small quantities at first. The stomach and intestines undergo rest, and recuperate if the horse is turned to grass for a time each year. It is also certain that during febrile diseases grass acts almost as a medicine, lessening fever and favoring recovery. Wounds heal more rapidly than when the horse is on grain, and some chronic disorders (chronic cough, for instance) disappear entirely when at grass. In my experience, grass does more good when the horse crops it himself. This may be due to the sense of freedom he enjoys at pasture, to the rest to his feet and limbs, and for many other similar reasons. When cut for him it should be fed fresh, or when but slightly wilted.

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Some Useful Prescriptions.

In localities where there are practically no facilities for obtaining professional aid for the stock-breeder, the following prescriptions will prove useful. These are contained in F. T. Barton's book on "Cattle, Sheep and Pigs," page 189.

Ointment for Ringworm.

Iodine 2 drachms
Carbolic Acid 1 drachm
Benzoated Lard 1 ounce

Mix and make ointment. Directions: Apply to the rings after washing with soft soap and warm water, every other day.

Ointment for Sores, Ulcers, Etc.

Boracic Acid Ointment.. $\frac{1}{2}$ ounce
Oxide of Zinc Ointment.. $\frac{1}{2}$ ounce
Red Oxide of Mercury Ointment 3 drachms
Carbolic Acid 1 drachm

Mix thoroughly. Directions: Apply a little to the sore place twice daily.

Ointment for Mange.

Oil of Tar 2 drachms
Red Oxide of Mercury Ointment $\frac{1}{2}$ ounce
Green Iodide of Mercury Ointment 2 drachms
Vaseline 1 ounce

Mix. Directions: Rub in well once daily.

Ointment for Inflamed Udder.

Extract of Belladonna. 1 ounce
Benzoated Lard $4\frac{1}{2}$ ounces
Lanoline $4\frac{1}{2}$ ounces

Mix thoroughly in that heat. Directions: Smear over the inflamed under twice or three times daily.

Turpentine Ointment for Setons.

Common Turpentine..... 1 ounce
Lard 3 ounces

Melt together over warm water, and stir cold. Dress seton.

Blistering Ointment.

Powdered Cantharides .. 1 ounce

Prepared Lard 6 ounces

Melt together in a jar, surrounded by hot water, for three hours, and stir occasionally; while hot, filter through paper, and allow the clear liquid to cool. Uses: For blistering.

Oxide of Zinc Ointment.

Powdered Oxide of Zinc. 3 ounces
Glycerine 2 ounces
Benzoated Lard 13 ounces

Mix in a stone mortar. Uses: For slight abrasions and ulcers.

Sulphur Ointment.

Flowers of Sulphur 2 ounces
Lard 16 ounces

Mix. Uses: For mange and Eczema.

Liniment of Turpentine.

Soft Soap 2 ounces
Camphor 1 ounce
Spirits of Hartshorn... 2 drachms
Oil of Thyme $\frac{1}{2}$ drachm
Oil of Turpentine 16 ounces

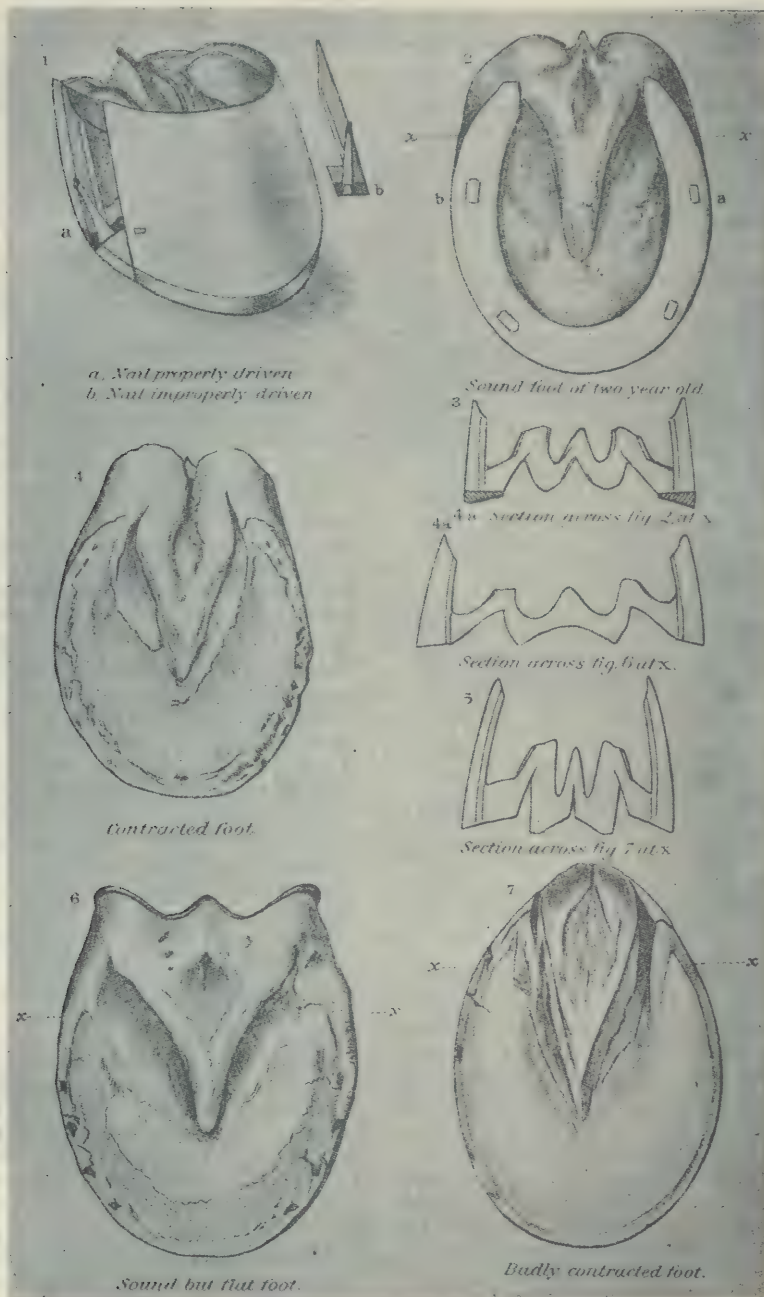
Dissolve the camphor in the turpentine; then add the soap until this is all dissolved; this latter can be done by rubbing in a mortar, or shaking in a bottle. Now add the other ingredients. Uses: For slight attacks of sore throat, sprains, bruises, rheumatism (join felon) and colds about the chest, etc.

Directions: If used for sprains or rheumatism, let the liniment be rubbed in well, and then apply a hot flannel bandage.

Liniment for Rheumatism and Stiff Joint.

Tincture of Opium 2 ounces
Tincture of Belladonna. 1 ounce
Spirits of Ammonia.... 1 ounce
Liniment of Capsicums.. $1\frac{1}{2}$ ounces
Chloroform $\frac{1}{2}$ ounce
Oil of Turpentine 2 ounces
Opodeldoc 1 ounce

Mix, and shake before rubbing in. Directions: Apply night and morning to the joints or stiff muscles.



Sound and Contracted Feet.

Blistering Liniment.

Croton Oil 1 ounce
 Oil of Turpentine 6 ounces
 Olive Oil 1 ounce

Mix, by shaking the bottle. Directions: Rub the part to be blistered for ten or twenty minutes.

Green Liniment.

Verdigris 4½ ounces
 Powdered Alum 3 ounces
 Treacle ¾ pound

Boil, and mix together until the mixture has a brown tinge. Uses: For foul affecting the feet, and foot-rot of sheep.

Camphor Liniment.

Camphor 1 ounce
 Olive Oil 2 ounces

Dissolve the camphor on the oil with the aid of heat. Uses: A stimulating liniment; very useful for applying to the throat, chest or belly after fomenting.

Wound Liniment.

Carbolic Acid ½ ounce
 Oil of Tar 2 drachms
 Rape Oil added 10 ounces

Mix, and use with tow, or this, and a bandage, if applicable.

Cooling Lotion for Sprains, etc.

Nitrate of Potash 2½ ounces
 Sal Ammoniac 2½ ounces
 Cold water 1 pint

Directions: Dip cloths into the liquid and apply to the inflamed part.

Lotion for Mange.

Slaked Lime 8 ounces
 Flower of Sulphur 8 ounces
 Water 3½ pints

Mix, and boil together until the liquid measures one quart. Now filter it, and dress all the diseased parts; or what is better, dress the animal from head to foot. Six times this quantity may be made at once for a trifling sum.

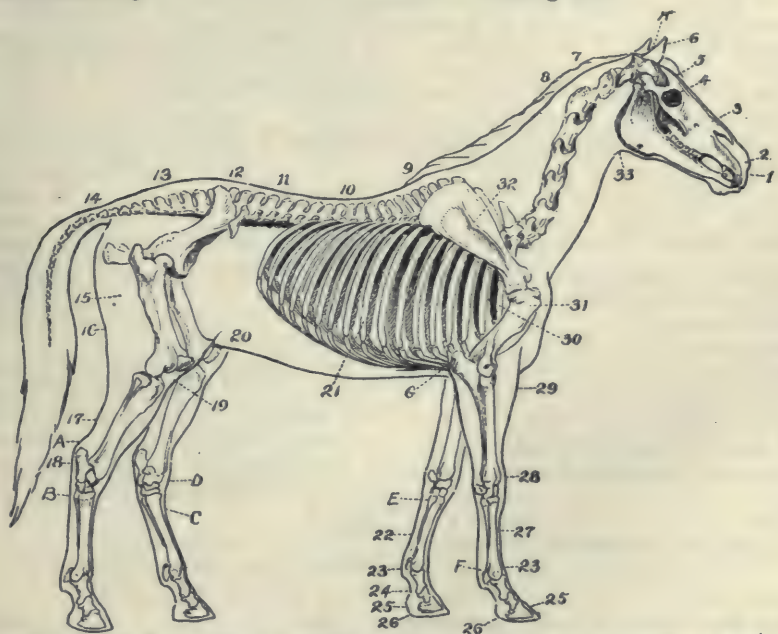


Fig. 40. Parts of the horse. 1, Muzzle; 2, nostrils; 3, face; 4, eye; 5, forehead; 6, ear. 7, neck; 8, crest; 9, withers; 10, back; 11, loin; 12, hip; 13, croup; 14, tail; 15, thigh; 16, quarter; 17, gaskin or lower thigh; 18, hock; 19, stifle; 20, flank; 21, ribs; 22, tendons; 23, fetlocks; 24, pastern; 25, foot; 26, heel of foot; 27, canon; 28, knee; 29, forearm; 30, chest; 31, arm; 32, shoulder; 33, throatlatch; A, thoroughpin; B, curb; C, bog and blood spavin; D, bone spavin; E, splint; F, windgall; G, cappel elbow; H, poll evil.

White Lotion.

White Vitriol (Zinc Sulphate)	$\frac{3}{4}$ ounce
Sugar of Lead	$\frac{3}{4}$ ounce
Water	1 pint

Mix, and filter through blotting paper; use the clear liquid, after adding another pint of water.

Directions and Uses: Is a first-class lotion for all kinds of sores, bruises, stings, etc.

Eye Lotion.

Sulphate of Zinc.....	40 grains
Solution of Sulphate of Atropine	2 drachms
Water	8 ounces

Mix. Directions: Apply to eye twice daily with a soft piece of cloth. Uses: For inflammation of the eye and cloudiness of vision.

Saline Purgative (for Adult Cattle Only).

Epsom Salts	$\frac{1}{2}$ pound
Glauber's Salts	$\frac{1}{2}$ pound
Common Salt	$\frac{1}{2}$ pound
Ginger	1 ounce
Powdered Pimento	1 ounce

Mix. Directions: Give in a quart of warm water. Treacle can be added if thought desirable.

Anodyne Draught (Anti-Pain or Colic Draught. For Cattle Only).

Tincture of Belladonna..	3 drachms
Tincture of Hyoscymus..	4 drachms
Chloral Hydrate	2 drachms
Laudanum	3 drachms
Chloric Ether	1 ounce
Water	1 pint

Mix. Repeat in four hours' time, if necessary. Uses: For internal inflammation, and straining after calving.

Extra Strong Purgative (For Cattle Only).

Epsom Salts	1 pound
Gamboge	$\frac{1}{2}$ ounce
Powdered Carbonate of Ammonia	$\frac{1}{2}$ ounce
Powdered Ginger and Allspice, of each	1 ounce

Mix the ingredients together, and give the whole in a quart of warm water, to which a quarter of a pound of treacle has been added. Uses: For fardel-bound, or any form of constipation in cattle.

Strong, Oily Purgative (for Cattle Only).

Croton Oil	20 drops
Oil of Juniper	30 drops
Oil of Peppermint	20 drops
Linseed Oil	1 pint

Mix together whenever a powerful purgative is indicated.

Aperient Draught (Laxative Medicine) (For Cattle Only).

Sodium Sulphate	$\frac{1}{2}$ ounce
Liquid Extract of Sacerd Bark	5 drachms
Tincture of Rhubarb..	3 drachms
Tincture of Belladonna..	3 drachms
Sal Volatile	3 drachms
Chloric Ether	3 drachms
Water added	1 pint

Mix, and give just as it is. Uses: In fevers of various kinds. It may be repeated if needful.

Laxative or Aperient Powders (For Cattle Only).

Epsom Salts	2 pounds
Glauber's Salts	2 pounds
Powdered Nux Vomica...	1 ounce
Powdered Ginger	2 ounces
Aniseed	2 ounces

Mix thoroughly and divide into twenty-four powders.

Directions: Give one every evening in a pint of cold gruel. Treacle can be added to increase the activity of these powders. Uses: Whenever it is believed that the animal requires its bowels gently and gradually acted upon.

Tonic Powders (for Cattle Only).

Powdered Cinchona Bark	6 ounces
Powdered Gentian.....	6 ounces
Powdered Nux Vomica..	1 $\frac{1}{2}$ ounces
Powdered Bicarbonate of Potash	1 $\frac{1}{2}$ ounces

Linseed Meal 6 ounces
 Mix thoroughly in a mortar, and divide into one dozen powders. Directions: Give one powder night and morning in a pint of warm ale, gruel, or water.

Tonic Draught (for Cattle Only).

Quinine 1 drachm
 Dilute Sulphuric Acid.. 2 drachms
 Tincture of Steel..... $\frac{1}{2}$ ounce
 Tincture of Calumba

Root 1 ounce
 Water added to make one pint.

Mix and give thrice daily, just as it is. This will be found a most excellent draught for assisting in restoring the health of the animal.

Some Popular Remedies for Sheep and Lambs Utilizing Mutton.

There are some diseases in sheep and lambs that are beyond the reach of medicinal agents, whereas, on the other hand, there are others which are benefited by the simplest of remedies. The recuperative powers of tea for sheep and lambs are well known among flockmasters, from half to a pint of strong tea being given two or three times a day. The following will be found a safe and efficacious saline purge, and can be repeated if necessary:

Saline Purgative Drench.

Epsom Salts 4 ounces
 Powdered Ginger 2 drachms
 Aniseed 2 drachms
 Bicarbonate of Soda.... 2 drachms

Mix, and dissolve in a half-pint of tepid water. The whole to be given to a sheep, or half the quantity to a lamb, at about 6 months.

Saline Diuretic Draught.

Epsom Salts 4 ounces
 Powdered Nitre 1 drachm
 Powdered Ginger 2 drachms
 Mix, and give as above.

Laxative and Stimulant Draught.

Epsom Salts 1 ounce
 Powdered Caraway Seeds 2 drachms
 Powdered Carbonate of

Gentian, Ginger, and Iron Powders
 (for Cattle Only).

Powdered Gentian Root... 4 ounces
 Powdered Ginger Root... 4 ounces
 Powdered Sulphate of Iron 2 ounces

Mix, and divide into twelve powders. Directions: Give one night and morning in a pint of ale, gruel, or water.

Draught for Tape-Worm (for Cattle Only).

Liquid Ext. of Male Fern. $\frac{1}{2}$ ounce
 Linseed Oil $1\frac{1}{2}$ pints
 Oil of Juniper 30 drops

Mix. Directions: Before giving, withhold food for twenty-four hours. Repeat in a week's time.

Ammonia 1 drachm
 Powdered Gentian 2 drachms

Mix, and give in half a pint of warm tea.

Tonic Draught.

Powdered Cinchona
 Bark 1 drachm
 Powdered Sulphate of
 Iron 1 drachm
 Powdered Gentian 2 drachms
 Aniseed 1 drachm

Mix, and give as above.

Draught for Scour.

Chlorodyne 1 drachm
 Prepared Chalk 2 drachms
 Sal Volatile 1 drachm
 Starch Gruel 4 ounces

Mix, and give the whole, and repeat night and morning.

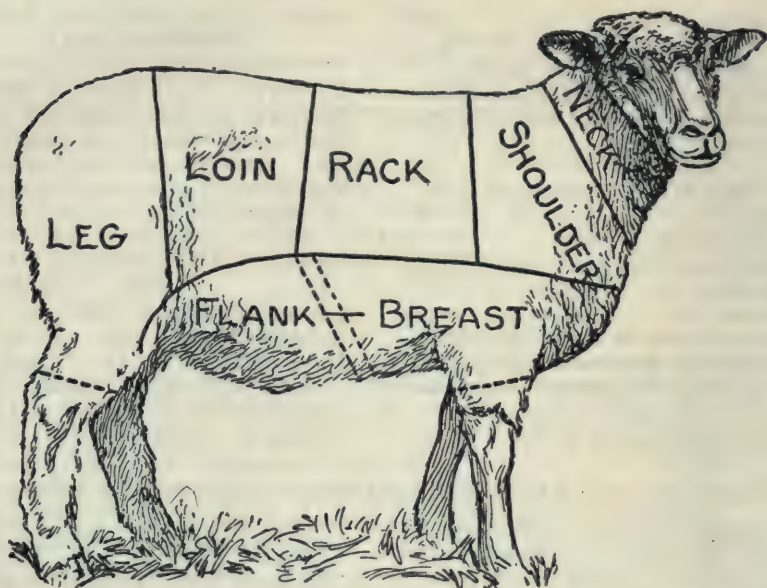
Draught for Hisk or Hoose.

Oil of Eucalyptus..... $\frac{1}{2}$ drachm
 Terebene 1 drachm
 Linseed Oil 4 ounces

Mix, and give the whole. Repeat twice or thrice weekly.

Dressing for Wounds.

Oil of Eucalyptus..... $\frac{1}{2}$ ounce
 Pure Carbolic Acid $\frac{1}{2}$ ounce
 Olive Oil to make 10 ounces



Utilizing Mutton. Neck: Stew; Shoulder: Chops, roast, boiling; Rack: Chops, roast; Loin: Chops, roast; Leg: Roast, steak; Flank: Stew; Breast: Stew; Shank: Stew.

Apply to wounds two or three times a day.

Dressing for Foot-Rot.

Powdered Subacetate of

Copper ½ ounce

Oil of Eucalyptus..... ½ ounce

Oxide of Zinc 1 ounce

Powdered Charcoal 1 ounce

Powdered Cinchona

Bark ½ ounce

Pure Carbolic Acid 1 drachm

Spirits of Wine ½ ounce

Treacle sufficient to make the whole form a paste capable of easy application to the feet, which should be pared, so as to remove all diseased horn, before the application of the remedy.

Dressing for Maggots.

Creosote 6 ounces

Bicarbonate of Potash.. 3 ounces

Linseed or other cheap

oil 3½ pints

Mix the creosote with the bicarbonate of potash after the latter has been dissolved in six ounces of warm water, and then add the oil, shaking well before using.

Draught—Anti-Pain for Ewes.

Laudanum 2 drachms

Sulphuric Ether ½ ounce

Sweet Spirits of Nitre.. 2 drachms

Cold Water 4 ounces

This draught can be repeated every four or six hours if necessary.

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		Mare 43 wks.	Cow 40 wks.	Ewe 21 wks.	Sow 16 wks.
1	Th	Dec. 3	Oct. 8	Mar. 28	Apr. 23
2	Fri	4	9	29	24
3	Sat	5	10	30	25
4	S	6	11	31	26
5	M	7	12	June 1	27
6	Tu	8	13	2	28
7	W	9	14	3	29
8	Th	10	15	4	30
9	Fri	11	16	5	May 1
10	Sat	12	17	6	2
11	S	13	18	7	3
12	M	14	19	8	4
13	Tu	15	20	9	5
14	W	16	21	10	6
15	Th	17	22	11	7
16	Fri	18	23	12	8
17	Sat	19	24	13	9
18	S	20	25	14	10
19	M	21	26	15	11
20	Tu	22	27	16	12
21	W	23	28	17	13
22	Th	24	29	18	14
23	Fri	25	30	19	15
24	Sat	26	31	20	16
25	S	27	Nov. 1	21	17
26	M	28	2	22	18
27	Tu	29	3	23	19
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29	Th	31	5	25	21
30	Fri	Jan. 1	6	26	22
31	Sat	2	7	27	23

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1	S	Jan. 3	Nov. 8	June 28	May 24
2	M	4	9	29	25
3	Tu	5	10	30	26
4	W	6	11	July 1	27
5	Th	7	12	2	28
6	Fri	8	13	3	21
7	Sat	9	14	4	30
8	S	10	15	5	31
9	M	11	16	6	June 1
10	Tu	12	17	7	2
11	W	13	18	8	3
12	Th	14	19	9	4
13	Fri	15	20	10	5
14	Sat	16	21	11	6
15	S	17	22	12	7
16	M	18	23	13	8
17	Tu	19	24	14	9
18	W	20	25	15	10
19	Th	21	26	16	11
20	Fri	22	27	17	12
21	Sat	23	28	18	13
22	S	24	29	19	14
23	M	25	30	20	15
24	Tu	26	Dec 1	21	16
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		Mare 43 wks.	Cow 40 wks.	Ewe 21 wks.	Sow 16 wks.
1	S	Jan. 31	Dec. 6	July 26	June 21
2	M	Feb. 1	7	27	22
3	Tu	2	8	28	23
4	W	3	9	29	24
5	Th	4	10	30	25
6	Fri	5	11	31	26
7	Sat	6	12	Aug. 1	27
8	S	7	13	2	28
9	M	8	14	3	29
10	Tu	9	15	4	30
11	W	10	16	5	July 1
12	Th	11	17	6	2
13	Fri	12	18	7	3
14	Sat	13	19	8	4
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" Maple Leaf " Brand Oil Cake Meal
Old Process—Absolutely Pure

Manufactured By

The Canada Linseed Oil Mills, Limited - Montreal and Toronto

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27	M		29	Feb. 1	21	17
28	W		30	2	22	18
29	Tu		31	3	23	19
30	W		Jan. 1	4	24	20

A Subscription

To Canadian Farm costs but \$1.00 per year, and is worth many times the price.

CANADIAN FARM

Farm Press, Limited, 12 East Wellington St. Toronto, Ont.

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You insure your animals against death—why not insure them for health ?

By feeding "Maple Leaf" brand Oil Cake Meal

You Do This

The Canadian Linseed Oil Mills Limited

MONTREAL AND TORONTO

Day of Month and Week, with space for Name of Animal served, &c.		Animals served on given dates of present month, due to give birth as follows :			
		Mare 43 wks.	Cow 40 wks.	Ewe 21 wks.	Sow 16 wks.
1	M	May 3	Mar 8	Oct 26	Sept 21
2	Tu	4	9	27	22
3	W	5	10	28	23
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5	Fri	7	12	30	25
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Live Stock Advertising in
CANADIAN FARM
 brings best results.

Farm Press, Ltd.,

12 East Wellington St.,

Toronto, Ontario.

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Live Stock Breeders

To get the best results, feed "Maple Leaf" brand
Oil Cake Meal—Old Process—Absolutely Pure

The Canadian Linseed Oil Mills Ltd., Manufacturers, Montreal & Toronto

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Timely Subjects

Of interest to Live Stock Breeders and Farmers each week in

CANADIAN FARM

Farm Press, Limited, 12 Wellington E., Toronto, Ontario

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CANADIAN FARM

bring best results

Farm Press, Limited,

Toronto, Ont.

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Keep Up-to-Date

On all Farm subjects, by reading

CANADIAN FARM

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Keep Up-to-Date

On all Farm Subjects by reading

CANADIAN FARM

Farm Press, Limited, Toronto, Ont. 12 East Wellington St.

THE FARM DAIRY

1. The milk scale has two indicators. One rests at zero when there is nothing on the scale. The other is to be set at zero when the empty pail is on the scale. This one records the weight of the milk directly.

2. Let the pail hang on the scale while recording the weight of the milk.

3. If there is not time to weigh the milk every day, weigh it for three successive days in the month or at intervals as the 5th, 15th and 25th, then to find the average production of each cow, divide the total amount of milk recorded from each cow by the number of days the milk is weighed. Multiply the result by the number of days in the month which will give approximately the total production for the month.

Taking the Sample.

1. The best time to take the sample to test is immediately after weighing the milk.

2. Always mix the milk well before taking the sample to thoroughly distribute the cream.

3. The best sample bottles are closed air tight to prevent evaporation which increases the test. Label each bottle with the name or number of the cows so the samples will not get mixed.

4. If a sample from a single milking is to be tested take half a pint. Where a composite sample is made from several milkings retain about two tablespoonfuls each time.

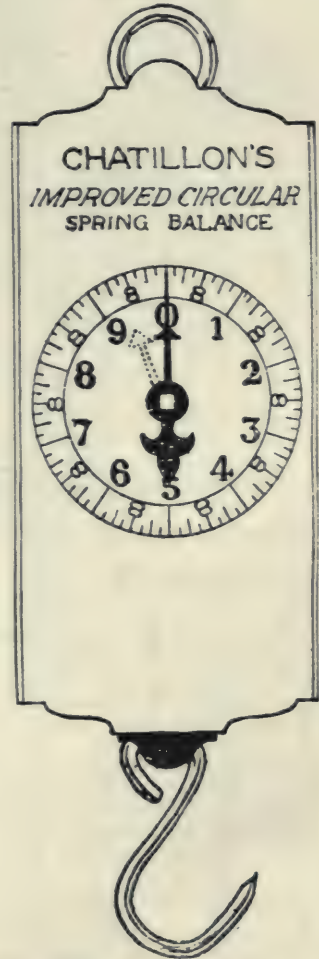
5. A composite sample is made up by taking two tablespoonfuls from several milkings and keeping until ready to test.

6. If the sample is held for a time, in warm weather, use a preservative tablet to keep the milk from souring. These tablets are poisonous and need to be handled with care.

Making the Babcock Test.

Any one can readily learn to make the Babcock test. A complete testing outfit, including tester, glassware,

and acid, with instructions, can be secured from the hardware store or any of the creamery supply houses for about \$5.00.



These scales will weigh 30-60 lbs. and have a loose pointer which by means of a thumb screw on the centre may be set anywhere on the dial; thus taking the tare of the milk pail. The price of these is given in test of dairy equipment.

INDIVIDUAL COW MILK RECORD.

For 30 days ending.....
Name.....
P.O.....
Province.....

DESCRIPTION OF COWS.					3 DAYS' WEIGHINGS OF MILK.				Total Pounds of Milk Calculated for 30 Days.		BUTTER FAT.	
Name.	Breed.	No.	Age.	Date of last calf.	Dates.				Per cent.	Total pounds.		
					A	M	16	15				
		1			P	M	15½	14½	15			
		2			A	M						
		3			P	M.						
					A	M						
					P	M.						
		4			A	M						
					P	M.						
		5			A	M						
					P	M.						

This form may be extended to take records for more cows. Copies, ruled for 18 cows, may be obtained on application to the Dairy and Cold Storage Commissioner, Ottawa. State in your letter which milk record form is required; that for daily weights, or this one for 3 days per month.

It will assist in keeping correct records if the *name* of the cow is given as well as her number. The details of age, breed and date of calving need be given only once, but make certain of having these particulars of each cow. State whether grade or pure bred.

Each cow must keep her own number right through the season. If she goes dry, and freshens again during the year, she must appear on the record again under her original number.

If a cow is disposed of, state for what reason.

To Make the Babcock Test.

1. Mix the sample of milk well by pouring from one beaker or bottle to another; then measure into a test bottle with a pipette 17.5 c.c. of the milk as marked on it.

2. Add to each bottle 17.5 c.c. of sulphuric acid (as marked on the measure) and mix well by rotary motion until all of the curd is thoroughly digested and a "coffee brown" color appears.

3. Put the bottles into the tester and whirl at full speed two to four minutes.

4. Add hot water to each bottle until the butter-fat rises up to the neck.

5. Whirl again at full speed two to four minutes.

6. Add hot water until the butter-fat rises half way up the neck of the bottle; then whirl one minute and read the test.

Reading the Test: Read from the extreme point of the top curve to the bottom of the fat column.

The test of the milk is marked in per cents on the neck of the test bot-

tle. If the milk test 33 per cent., it means that there are three pounds of butter-fat in each one hundred pounds of milk.

How to Keep Daily Records.**The Milk Sheet.**

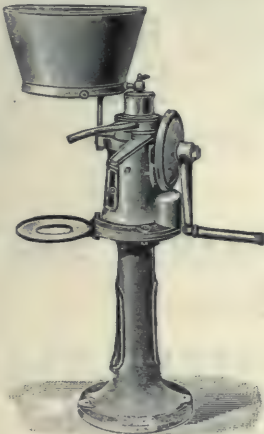
1. The milk sheet is made by ruling off space for each cow. Place the name or number of the cow at the top and record the weight of the milk for morning and evening in the space below. The same sheet may be used to cover a period of three days, a week or a month.

2. Place the record sheet in a convenient rack close to the milk scale and protect with a movable cover to keep it clean.

3. The best plan is to weigh the milk from each cow at every milking and record the weight on the sheet.

4. The daily milk record is the best as it serves both as a guide to the feeder and a check on the milkers.

5. A complete record serves as a basis of economy in the feeding of



The Keen Farmer Judges by Results

The Premier increases quantity and improves quality of butter. You are losing money if you are doing without a cream separator. Before purchasing examine the Premier carefully. Made in the largest and best equipped separator works in the British Empire. Are you using an old separator? Bear in mind if it is not doing good work you are losing just as much butter as you would by skimming with the pans in the old-fashioned way. Our agent will make you a liberal allowance for your old machine.

DON'T WASTE MONEY ON A POOR SEPARATOR.

It is to your interest to learn about the "PREMIER" Write us

The "Premier" gives results. Prove this by trying one free of cost.

The Premier Cream Separator Company

Toronto, Ont.

St. John, N. B.

individual cows. It requires comparatively little time, and is a complete index to the herd, to the feeder and to the milker.

Figuring Returns.

The net profits from the dairy herd is the difference between the income and the cost of maintenance.

The income includes the value of the butter-fat, the skim-milk, the calf and the manure.

"The annual cost of maintaining a cow comprises the following items: Cash sundries, cash feeds, farm feeds, labor (man and horse), general expenses, shelter, depreciation, machinery and equipment, herd bulls and interest on investment; the classification is somewhat arbitrary, as in some instances an item of cost might be charged to one class or another with equal correctness. Cash sundries comprise those items for which cash was paid—ropes, halters, veterinary services and medicine. Cash feeds are those purchased for cash,

farm feeds those produced on the farm. Labor includes both man and horse labor at the current rate of wages for the month and year, comprising all items of labor performed for and affecting the dairy. General expense comprises those items which are a charge to the entire farm, and is made up of cash and labor expenditures. The total for the farm is then apportioned to the productive enterprises of which the dairy is one.

Shelter is a fixed charge for the use of the building based on its cost, depreciation, repairs and the number of animals sheltered. Depreciation is based upon the productive life, death rate, original value of the cow for consumption.

Machinery and equipment charges are due to the use, depreciation, repairs and interest on the cost of the machinery and equipment of the dairy.

The charge for herd bulls is the cost of maintenance.

Interest on investment is interest at the rate of 5 or 6 per cent. on the



**Windsor
Cheese Salt
Makes
Prize
Cheese**

Ask every Dairyman you meet what salt he uses for Butter and Cheese making. You'll find that practically every one will tell you

WINDSOR DAIRY SALT
for Butter

WINDSOR CHEESE SALT
for Cheese

They know, by practical experience in the dairy, which salt is best.



THE VALUE OF KEEPING MILK RECORDS.
 The Unprofitable Cows on the Farm Are Weeded Out by Keeping Record of Production. This Illustration Explains Itself. Courtesy of North Dakota Agricultural College.

value of the cow at the beginning of the year. All items represent actual expenditures on the farms, excepting the charges of shelter and depreciation which are based on averages of all the farms for the entire period." From Bul. No. 124 Minnesota Experiment Station.

The hand power cream separator is the most reliable and best method of skimming milk at the farm.

Some of the advantages over the other methods are: (1) less loss of fat in the skim milk, (2) a better and more uniform quality of cream, and (3) the skim milk is in the best possible condition for feeding young stock. All the separators on the market will do efficient skimming if properly handled.

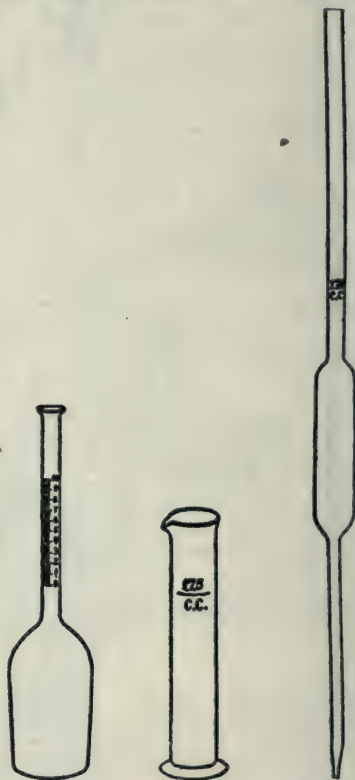
Handling and care of the Separator.—It is important that the separator run smoothly. Any trembling or shaking of the separator while skimming, will cause a loss of butter fat in the skim milk. Only special separator oil should be used, and it is well to make a run about once in three weeks, using kerosene oil on all the bearings.

In skimming, three things must be observed: (1) The speed of the separator must be maintained according to the directions sent with it. The only reliable way to do this, is to count the number of revolutions of the crank by the watch. A low speed means loss of fat in the skim milk. (2) The flow of the milk into the separator should be uniform. (3) The temperature of the milk should not be under 90 degrees and for that reason the best time to separate the milk is immediately after milking. A low temperature is also liable to cause loss of fat in the skim milk. The faster the milk passes through the separator, the less complete is the separation, and a thinner cream is given. Every separator has some device for changing the test of the cream. In most cases the adjustment is at the cream outlet. If so, by turning the cream screw in, the cream will be richer, and by turning it out, the cream will be thinner.

All the parts of the separator which come in contact with the milk or cream should be washed in lukewarm water, to which has been added a small quantity of sal soda or other

cleansing powder, and then thoroughly scalded with boiling water, each time the separator is used.

Location of Separator.—In some cases the separators are placed in the cow stables. This may be a convenient arrangement, but it is not by any means a proper place for separating milk, unless a special room, well ventilated and lighted, is partitioned off, to exclude the stable odours and dust.



From left to right: Graduated Bottle, Acid Measure and Pipette, used in Babcock Test.

This room should have a smooth cement floor, which can be easily cleaned.

Proper Temperature for Churning

Depends on—

Richness of the cream.

Length of time cows have been milking.

The breed of the cows.
The feed of the cows.

Conditions for Low Churning Temperatures (54° to 62°).

Very rich cream.
Cream from fresh cows.
Cream from cows on succulent food.
Cream from Jerseys and Guernseys.

Conditions for High Churning Temperatures (64 to 75).

Very thin cream.
Cream from cows a long time in milk.
Cream from cows on dry feed.

For Best Results in Farm Dairy Work.

Keep good cows.
Feed liberally.
Keep comfortable and clean.
Skim a rich cream.
Use clean pure water for washing butter, not more than three degrees warmer or cooler than the butter milk.

Keep cream cool.
Churn at a temperature that produces flaky granules.

Put butter up in neat attractive packages.

Keep everything in and about the dairy clean and attractive.

Composition of Milk Fat.

Fatty Acids.	Per cent.
Butyrin	3.85
Caproin	3.60
Caprylin .....	.55
Caprin	1.90
Laurin	7.40
Myristin	20.40
Palmitin	25.70
Stearin	1.80
Olein	35.00

Plants That Affect Cows and Their Product, if in the Pasture

Common Monk's Hood.
Pasque Flower.
Stinking Hellebore.
Garlic Mustard.
Wild Radish: Runch.
Fool's Parsley.
Hemlock.

Marsh Pennywort.
Pepper Saxifrage.
Wormwood.
Hawkweed.
Tansy.
Common Forget-Me-Not.
Lousewort.
Butterwort.
Corn Mint.
Spurge.
Crow Garlic.

Testing Cream.

Cream test-bottles are graduated to read as high as 30, 40 or 50 per cent. fat, and are made with a large neck. Use an 18 c.c. pipette for measuring cream. Rinse the pipette. After mixing the cream and acid, add the hot water before whirling, and whirl for five minutes. Place the bottles in hot water before reading. Each division of the scale reads one-half, or one per cent., according to the marking. The proper amount of cream, or milk, etc., for a test is 18 grams. The pipette is fairly accurate in delivering this weight, but in the case of very rich or greasy cream it is impossible to be sure that the volume measured will weigh 18 grams. For this reason, in many creameries, the test samples are weighed on scales manufactured for this purpose.

Testing Skim-Milk, Buttermilk, Whey.

Owing to the small percentage of fat in these products, to get accurate tests, double-nicked test-bottles should be used. The amount is taken in a 17.6 c.c. pipette and tested in the usual way. The milk has to be delivered slowly into the larger neck, or it bubbles out. The scale on the neck reads to one-hundredth of one per cent. On large division reads five-hundredths, or .05 per cent. fat.

Babcock Test for Butter.

1. Secure a representative sample of butter and place the vessel containing the butter in a tub of water at 100° F., and stir until the butter becomes a thin paste.

2. Weigh 4.5 grams or 9 grams into a cream bottle.

3. Add enough water at 70° F. to make 18 grams.

4. Add 17.5 Sulphuric Acid and mix thoroughly.

5. Continue the test the same as a test for cream.

6. Per cent. of fat = Reading \times 18.
No. of grams used.

Example. 4.5 grams butter taken.
Reading = 22.

Per cent. fat = $22 \times 18 \div$
 $4.5 = 88$ per cent. fat.

Poor Fat Tests.

Burnt or cloudy readings may be caused by:

(a) Having the temperature of the milk or acid too high.

(b) Using acid which is too strong, or using too much acid.

(c) Allowing acid to drop directly on and through the milk.

(d) Allowing the milk and acid to stand too long before mixing.

Light or cloudy readings or floating particles of curd are usually caused by:

(a) Temperature of milk or acid too low.

(b) Using too weak an acid or not enough acid.

(c) Careless mixing, or insufficient shaking to unite the milk and acid thoroughly.

Qualities of Good Butter: How it is Judged.

It is well to know what a judge looks for in a No. 1 butter, and work up to his requirements. Judges now almost universally use a score card, and the marks are approximately as follows:

Flavor	50
Texture or Grain	20
Color	15
Salt	10
Package	5

Total 100

Theory of the Babcock Test.

A 17.6 c.c. pipette will deliver, practically, 17.5 c.c. of milk.

17.5 c.c. at an average specific gravity of 1.032 = (17.5×1.032) = 18.06 grams.

18 grams is the weight of the milk required for a test.

The volume of the neck of the milk test bottle between zero and 10 is 2 c.c.

2 c.c. of melted fat, at a specific gravity of .9 = $(2 \times .9)$ = 1.8 grams.

The relation of 1.8 is to 18, as 1 is to 10, or 10 per cent. of the original volume of the milk. This is why that weight or volume of milk is taken and why the neck of the bottle is divided into 10 equal parts.

Feeds That Injure Flavor of Milk.

Turnips,

Rape.

Rye,

Turnip Tops.

Decayed Ensilage.

Leaks.

Onions.

Apples in large quantities.

Causes of Tainted Cream.

Cows' udders and teats unclean at milking time.

Milking in unclean, ill-lighted stables.

Using unclean wooden, galvanized and rusty pails.

Separating the milk in the stables.

Improperly cleaned separators.

Keeping the cream in cellars or other places where there are roots or vegetables.

Keeping the cream for several days at a temperature over 55 degrees.

Cows drinking water from stagnant ponds, or the leakage from barnyards.

Necessary Sanitary Conditions, Etc.

Abundance of pure water.

Free access to salt at all times.

Cleanliness in stables at all times.

Good ventilation and fresh air.

Kindly treatment.

Clean and pure food.

Moderate temperature in stable.

An abundance of tempered light.

Pasteurization.

Immediately after the cream is received it should be pasteurized. By pasteurizing we mean the heating of the cream to a temperature of 180° to 185° F., and then quickly cooling to ripening or churning temperature. No phase of our creamery work is so beneficial as pasteurization, and no phase of the work is so generally neglected. Why? Many creamery men say "it is too expensive," others say, "it is too much labor." Neither answer is correct. Our creameries are not pasteurizing for the same reason that our creamery patrons are not storing ice to cool their cream.

They do not know, or realize, the great benefit to be derived from it. The patron who neglects a supply of ice or other facilities for cooling his cream and the creamery man who neglects to pasteurize are both in the same canoe. Both are floating down instead of paddling up, the stream of progress, as they should, and as they would, did they once realize the benefits that would accrue from cooling and pasteurizing.

What Does Pasteurizing Do?

1st. It kills the greater number of bacteria in the cream. Some of these bacteria are disease producers; others injure the flavor of the butter.

2nd. It assists in making a more uniform product of butter.

3rd. It creates a clean seed-bed for the sowing of a pure lactic acid culture.

4th. It enhances the keeping quality of the butter.

Ripening.

By the term ripening, we mean the souring of cream. This is done by the addition of a pure, lactic acid culture to the cream immediately after pasteurizing and cooling. In most of our creameries the cream is

ripe enough before it reaches the creamery. The benefit of the culture in this kind of cream is the production of a desirable and uniform flavor in the butter.

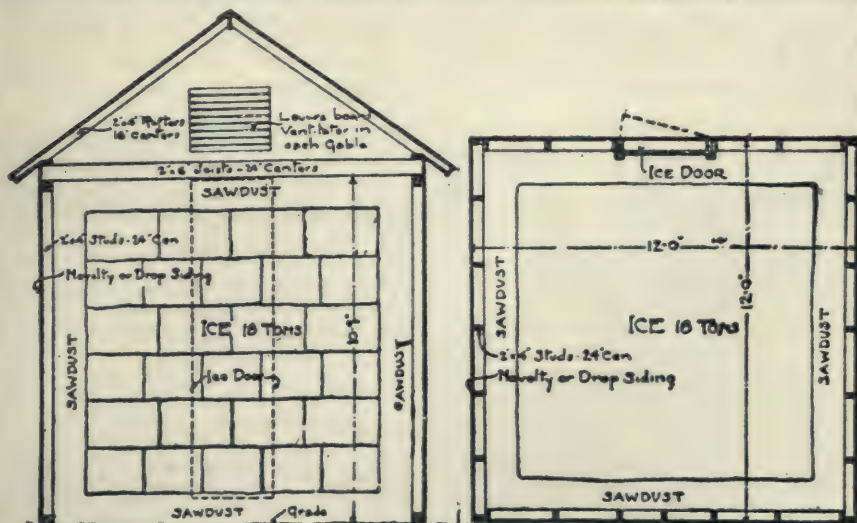
Cool the cream to a temperature between 60° to 70° F. Use about 10 per cent. of good culture (more if the cream is very bad), and allow the cream to develop .4 to .5 per cent. acidity. When the proper percentage of acidity has developed, cool the cream to churning temperature, and churn as soon as possible. Pasteurization and a good culture will do more to improve the quality of Ontario butter than any other treatment which the cream can receive.

Churning and Working.

By churning we mean the gathering of the fat globules together into butter, by means of concussion. The question is often asked, "What is the proper churning temperature of cream?" No definite temperature can be given. The churning temperature is influenced by:

1. The character of the butter-fat.
2. Acidity of the cream.
3. Percentage of fat in the cream.
4. The amount of cream in the churn.

1. The fat is influenced by the pro-



This illustration shows in detail the construction of small ice house on the farm. Note the capacity.

portion of soft and hard fats. Also by the period of lactation, and feed of the cows.

2. A ripened cream is more easily churned than an unripened cream.

3. The richer the cream (up to 35 per cent.) the more quickly it will churn, because, other conditions being equal, the fat globules are more numerous and come in contact more easily.

The churning temperature may range from 50° to 60° F., and even wider. Aim to have the cream churn in not less than 30 minutes and not more than 45. If cream is churned too quickly there will be a heavy loss of fat in the buttermilk; the butter will be soft and mushy; it will be hard to wash free of buttermilk; and will have poor keeping qualities. If the cream is churned too cold it will take much longer to churn, wasting time and power and the butter will tend to gather in hard, small granules, which will be difficult to work and salt. Avoid either extremes; try to have the cream churn in proper time. The butter should

be of a waxy texture, which will "knead" easily, when working in the salt.

Stop the churn when the granules of the butter are about the size of large grains of wheat. Draw off the buttermilk and wash well with water somewhere near the churning temperature of the cream. Use about the same amount of wash water as there was cream to start with. Nothing but pure water should be used. If the butter has been churned at the proper temperature, and the churning "stopped" at the right time, one washing should be sufficient. Where the butter is soft and mushy two washings are advisable. About 10 to 12 revolutions of the churn are sufficient for washing.

Milk Definitions.

Standard Milk is milk which conforms to certain requirements which usually specify the minimum per cent. of fat, and solids-not-fat, and sometimes the maximum number of bacteria per cubic centimetre allow-

Save Labor and Increase Your Profits

Get all that's coming to you from your cows, and at the same time make the work easier for the women folks.

The Massey-Harris Cream Separator skims close at all temperatures, is easy to fill, easy to turn and easy to clean, simple, safe and durable.

A new catalogue tells why. See later page regarding engines.



Massey-Harris Co., Limited

Head Offices—TORONTO, CANADA

Branches at—Montreal, Moncton, Winnipeg,
Regina, Saskatoon, Swift Current, Yorkton,
Calgary, Edmonton. Agencies Everywhere.

able in milk offered for sale. The amounts required or permitted differ in different countries.

Sanitary Milk, Guaranteed Milk, are terms applied to milk produced under conditions necessary to secure a pure, wholesome product.

Certified Milk is milk produced under ideal conditions,—healthy cows, especially adapted sanitary stables, healthy clean milkers. The milk is bottled, sealed, and shipped in refrigerator cars, and certified to by a commission.

Modified Milk, or Humanized Milk, is milk containing definite proportions of fat, sugar, casein, etc., put up usually according to the prescription of a physician, who indicates how much of these different constituents is required.

Clarified Milk is milk which has been run through a separator to remove some of the impurities. The skim-milk and cream are afterwards mixed.

Pasteurized Milk or Cream is milk or cream which has been heated below the boiling point, but sufficiently to kill most of the active organisms present, and immediately cooled to 50° or below. Pasteurizing temperatures range from 140° to 185°.

Sterilized Milk is milk that has been heated to the temperature of boiling water (212°) or higher for a length of time sufficient to kill all organisms present.

Condensed or Evaporated Milk is

milk from which a considerable portion of water has been evaporated. The sweetened brands contain a high percentage of cane sugar.

Peptonized Milk is milk to which some pepsin has been added in order to make the milk more easily digested.

Electrified Milk is treated by a current of electricity for the purpose of destroying bacteria.

Malted Milk is milk that has been pasteurized to destroy the bacteria, then partly condensed, and a small quantity of malt added.

Milk Powder is obtained by evaporating the moisture from whole milk, partly skimmed milk, or skim-milk. The powder is used by confectioners, certain manufacturers, surveying parties, and in such countries as the basin of the Yukon.

Koumiss is the product made by the alcoholic fermentation of milk caused by adding yeast and sugar to it.

Food Value of Milk.

A man of average weight (147 pounds), when kept inactive, as when kept in bed, can live and sometimes put on flesh on three quarts of milk per day, this quantity containing 15 ounces of dry solids—fat, sugar and casein; but if the quantity is increased to four quarts a day the food consumed is sufficient to enable him to do a good day's work, according



Camembert Cheese Ready for Making.

to Professor Long of England. We at once admit that so large a quantity of fluid would not be suitable as diet for a healthy man. We simply show that the feeding matter consumed by an average man should be 3,500 calories, and such we find in 1 1-2 pounds of bread, one-half pound potatoes and 3-4 of a pound of boneless beef and 3 ounces of butter; but, excepting butter, there is in the other foods not only waste material which cannot be digested, but a large quantity of moisture. As four quarts of milk are equal in caloric value to this ration, for there is no waste, it follows that a man may attain as much nutrition from four quarts of milk as from the more substantial ration. Again, it has been shown that in a pint of milk with bread (10 ounces) there was more nutrition than in a restaurant meal consisting of soup, beef, some cabbage, bread and butter, with a cup of coffee containing milk and sugar, which costs just twice as much.

Double-Cream Cheese.

This cheese is exceptionally rich in fat; is of a very smooth texture; and is delicious, spread on crackers or eaten with bread.

The cream may be sweet or very slightly sour. Heat to a temperature of 60° to 65°. To 20 pounds (2 gallons) of cream add one dram of rennet (a teaspoonful) diluted in a little water. Stir well. In about four hours the cream will have coagulated. Pour it into dry cloths drain in a cool, draughty place. The cloths should be of close duck and placed over bowls. Then hang up to should be dry. It is advisable not to put very much curd in one cloth, as it is liable to develop too much acid before draining is complete.

In two or three hours open the cloth and scrape down the sides. Hang up again. Repeat the scraping at intervals of about three hours, till the cheese is firm enough to mould. The draining may be hastened by scraping down more frequently.

When the cheese is ready to mould it should be of a stiff, putty consistency, but not sticky. Salt is now added at the rate of one ounce of salt to four pounds of cheese. Work the

salt in with a knife or spatula, and the cheese is ready to mould. The tin or mould for cream cheese is usually oblong in shape—3½ x 1½ x 2 inches. Line the mould with waxed butter-paper and press the cheese in with a knife or spatula. When full, fold over the ends of the paper and shake out the mould of cheese.

The cheeses when moulded are ready for immediate use. If kept in a cool place they remain good for a week or two. Cream cheese contains about 31 per cent. water, 63 per cent. fat, 5 per cent. proteids, 1 per cent. ash.

Gervais Cheese.

This cheese resembles soft double-cream cheese but not so rich—similar to rich, smooth cottage cheese.

Take 3 pints of fresh morning's milk and 1½ pints of cream of about 20 per cent. fat. Heat it to 65°. Take eight drops of rennet, and if you have it, two drops of cheese color. Dilute these in a little cold water and stir very thoroughly into the milk. Cover over the dish and keep at as near 65° as possible.

In about four hours, or when a nice, firm coagulation has taken place, wet a heavy linen huckaback towel, place it over a dish, and carefully ladle out the curd. Gather up the four corners of the towel and tie rather loosely. Hang to drain. Two or three times during the day untie the towel and scrape down the curd to hasten the drainage. Next morning scrape down again and mix in a little salt. After a little while fill into a small mould, which has been lined with white blotting paper or writing paper. Use a thin-bladed knife to press the cheese in the mould. After it is filled, slip out the cheese and use the mould again until all the curd is moulded. The usual-sized mould is 2 inches in diameter by 2½ inches high. A round spice or baking-powder tin answers.

The cheeses are fit for eating as soon as finished. They will keep for a week or more in a cool place.

Cambridge Cheese.

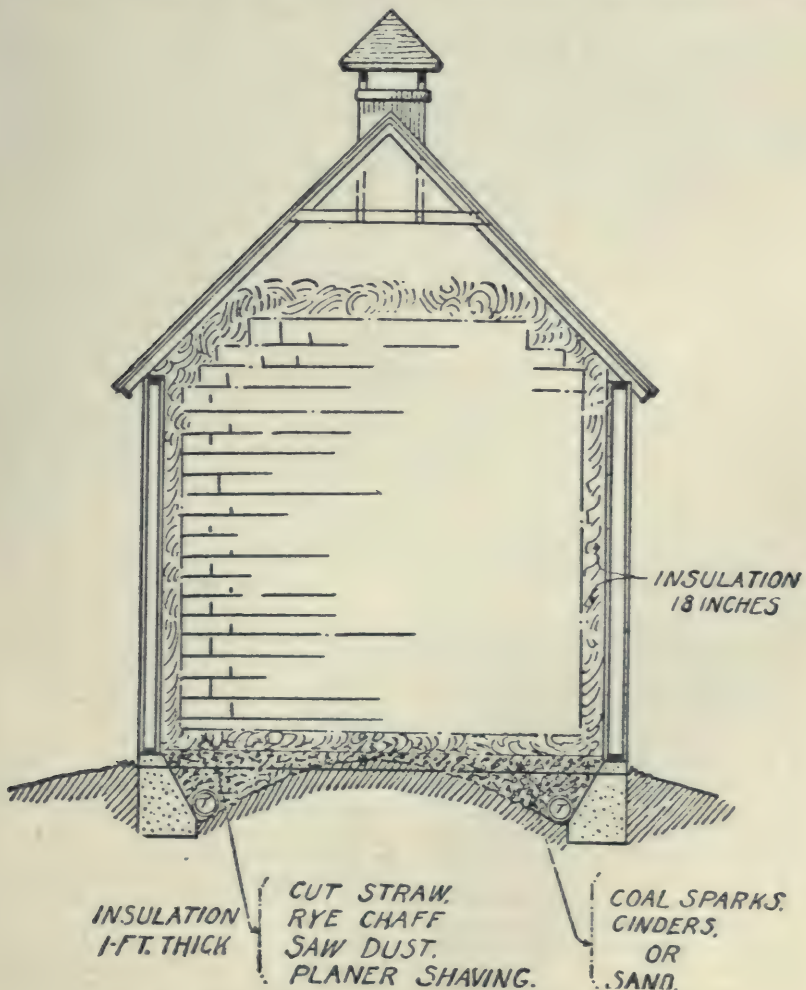
Heat 1 gallon of new milk in an enamelled pail or dish to 95°. Add

to it 3 drops of cheese color and 15 drops of rennet mixed in a little cold water. Stir for five minutes. Let stand for five minutes. Then stir the surface a little to prevent the cream from rising; cover the pail with a cloth and leave it undisturbed. At the end of an hour or an hour and a quarter, if coagulation should and a quarter, coagulation should be about as firm as a baked custard. Try it by inserting the finger and notice how the curd breaks off it.

Wooden moulds are usually used for these cheeses, but tin biscuit

boxes, with the bottoms removed, and with nail holes punched from the inside out, on the sides, to act as drains, might be used. The wooden moulds are 7 x 6 x 4 inches, with no bottom in them. Small holes, an inch apart, are bored in the sides. These moulds are scalded, placed on a mat made of straws sewed together, and put on a small board. The mat acts as a drain.

When the curd is sufficiently firm, carefully ladle out enough to cover the bottom, then add a little more at intervals of fifteen minutes, till all



Ice House With Proper Insulation at Base.

is ladled into the moulds. A gallon makes two cheeses. When they shrink from the sides and are comparatively firm and dry remove the moulds. They are now ready for use. It usually takes two days for them to drain in the moulds.

No salt is put on these cheeses, although some people prefer to sprinkle a little over them.

The manufacture of these cheeses is well adapted to farm dairying, and they should find ready sale on the market.

Bondon Cheese.

This cheese is made from a mixture of two-thirds sweet skim-milk and one-third good buttermilk. Mix together and keep at a temperature of about 80° until it thickens, then ladle into a huckaback towel. When well drained, open out and scrape down the curd. Tie up again and repeat the scraping occasionally until the curd is firm, then slightly salt and press into a bowl, or mould into small balls. A very cheap, highly nutritious food.

Twenty-Five Reasons.

Cow testing enables one to find out the poorest cows, those not paying for their feed, so that they may be got rid of.

In many cases one-quarter of the cows in the herd have been discovered to be not worth keeping, in some cases half the herd and even as high as three-quarters have been turned out.

This means certainty in dairying, no more guess work as to individual performance.

Cow testing shows that many cows considered only average are really the best in the herd.

Cow testing points out definitely which cows are the best producers, both in milk and butter fat.

Cow testing proves that many cows considered the highest in test are really the lowest.

Cow testing saves good cows from being beefed, they are found to be profitable when actual yield and cost of feed are considered.

Cow testing shows that many fine looking cows do not bring in much

cash from the factory.

Cow testing helps to discover the great difference in persistency of flow.

Cow testing brings to notice the slightest variation in flow and urges one to seek for the cause of the shrinkage.

Cow testing helps to increase the total of milk and fat from the same number of cows.

Cow testing brings in larger returns from fewer cows.

Cow testing helps to build up a profitable herd quickly because heifers can be selected from the best cows.

Feed Influence.

Cow testing allows more discrimination in feeding, apportioning the grain according to the yield of fat.

Cow testing emphasizes the benefit of liberality in feeding succulent, digestible foodstuffs.

Cow testing abundantly proves that it pays handsomely to give dairy cows the best of care and kind treatment; this includes regularity as to milking, early stabling in the fall, protection from cold rains, spraying to protect from flies; and above all, particular attention to cleanliness, light and ventilation in the stable.

Cow testing demonstrates that many good cows can be kept at a smaller cost of feed. This is not stinginess, but economy.

The Dairyman Himself.

Keeping records makes one more observant of all those little details that go to make up success.

Because cow testing develops this faculty of observation and induces sociations are becoming far better dairymen.

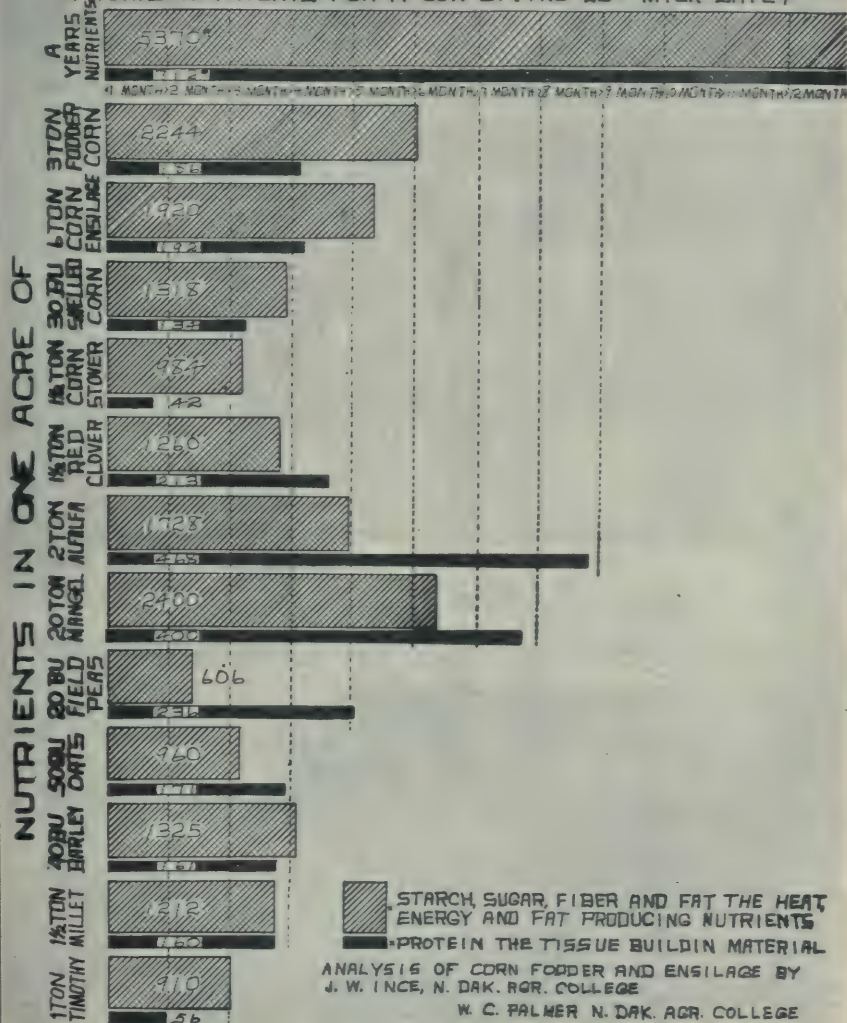
There is a great stimulus received from comparing notes and results with other members.

The hired men take more interest in the cows, consequently they give them better attention and get more milk.

Neighboring farmers who originally scoffed at the idea of cow testing have become impressed with the results obtained by members.

ACRES TO FEED A COW ONE YEAR

A YEAR'S NUTRIENTS FOR A COW GIVING 25th MILK DAILY



This chart explains itself. To make the shaded parts represent the carbohydrate parts the protein or tissue building in the number of pounds of each material said cow amounts to 5,370 pounds, and above three tons of fodder corn will only hydrates and only 186 pounds of the other feeds as well the feed needed for tained. The idea is to select such of the cow her full pounds of carbohydrates

it easy to comprehend understand that drates or fat formers, and the black aterial. The figures inserted represent named, thus a year's carbohydrates for protein 702 pounds. According to the supply 2,244 of this amount in carbohydrate. Thus by using some of the the balance of the year can be ascertained these feeds as will between them give and proteins.

A great measure of personal satisfaction results from studying each cow as an individual performer, not as a mere machine.

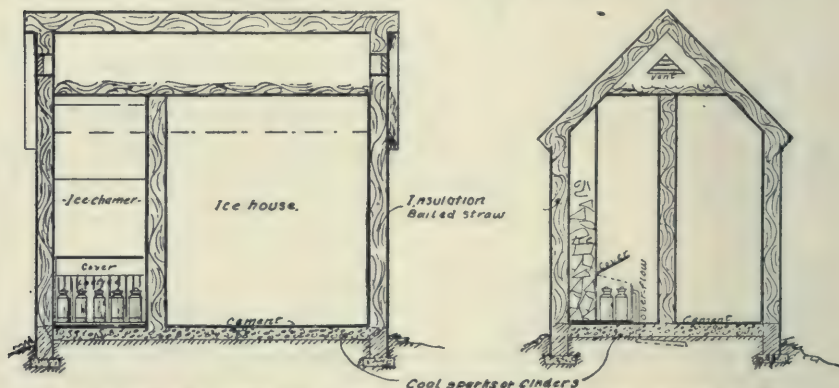
Cow testing increases one's love for good cows, and creates infinitely more pleasure in the work of the farm.

The definite knowledge obtained from the regular monthly testing is much more satisfactory in every way

than getting an occasional result only once or twice a year.

Financially, cow testing is of very great benefit; young bulls sell for higher prices. Cows sell for double the old prices when buyers see records.

Cow testing not only interests the boys and girls more and more in farm life, but materially assists in providing additional home comforts for the women and children.



Side View of Farm Ice House, Showing Construction and Packing.

FARM DAIRY EQUIPMENT FOR FROM FOUR TO EIGHT COWS.

1 No. 3 barrel churn	\$ 7.00
1 Floating thermometer .....	.25
1 Lever butter worker	4.50
2 Butter ladles .....	.30
1 Butter printer for lb. print	2.50
1 Large strainer dipper .....	.40
1 Large plain dipper .....	.25
1 Long handled dairy brush .....	.15
1 Small fibre brush .....	.20
1 5 gallon covered cream can .....	.75
1 Shotgun can .....	.60
1 Cream stirrer or ladle .....	.20
2 Large pails (14 qts. each) .....	.60
2 Shallow tin pans .....	.20
1 Bottle butter color .....	.25
5 Yards cheese cloth .....	.25
100 lbs. dairy salt .....	.50
1000 Printed parchment wrappers	2.50
240 lb. Union Scales	6.00
500 lb. Cream Separator	\$55.00 to 75.00
Four bottle tester complete	5.00
Tester for milk and cream	3.50

Prices will vary according to localities and differences in quality.

FARM POULTRY

Selection of a Breed.

Be sure that the male at the head of the flock is purebred.

The Mediterranean or egg breeds are: Leghorns, Minorcas, Spanish, Blue Andalusians, and Anconas.

The American or general-purpose breeds are: Plymouth Rocks, Wyandottes, Javas, Dominiques, Rhode Island Reds, and Buckeyes.

The Asiatic or meat breeds are: Brahmas, Cochins, and Langshans.

The English breeds are: Dorkings, Orpingtons, and Redcaps.

For farm use the American breeds are probably the best.

Purebred poultry means uniformity of products.

Uniformity of products means increased profits, if products are properly marketed.

Given the same care and feed, purebred fowls will make a greater profit than mongrels.

Artificial and Natural Incubation and Brooding.

Have everything ready beforehand

and start your hatching operations early in the year.

A well-ventilated cellar is the best place to operate the incubator.

The machine should be operated according to the manufacturer's directions.

See that the incubator is running steadily at the desired temperature before filling it with eggs. Do not add eggs to a machine during incubation.

Turn the eggs twice daily after the second and through the eighteenth day. Cool the eggs once daily, according to the weather, from the seventh through the eighteenth day. Turn the eggs before caring for the lamp.

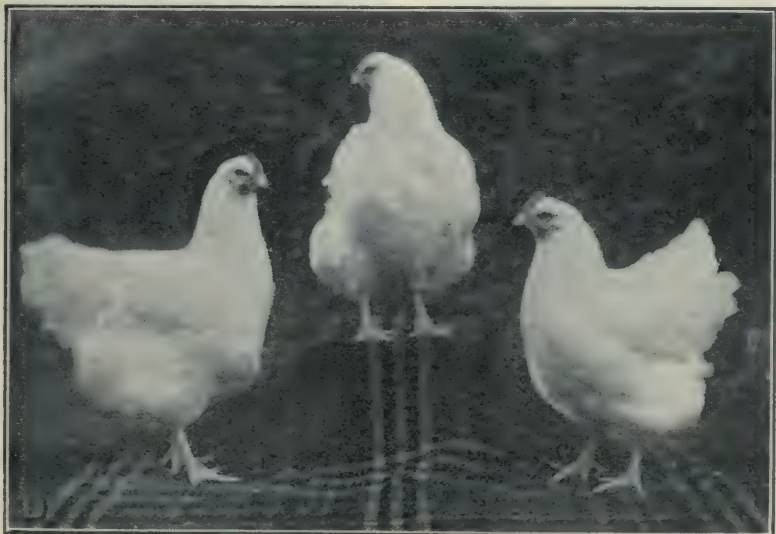
Attend to the machine carefully at regular hours.

Keep the lamp and wick clean.

Test the eggs on the seventh and fourteenth days.

Do not open the machine after the eighteenth day until the chickens are hatched.

Eggs saved for hatching purposes.



A Trio of Prize Winning White Orpingtons.

should not be subjected to high or low temperatures.

In cold weather place from 10 to 13 eggs under the hen; in warm weather from 13 to 15.

Always test the hen on china or nest eggs before setting.

Given proper care and attention, the hen is the most valuable incubator for the farmer.

Use insect powder freely to exterminate lice when necessary.

February, March, and April are the best months for hatching.

If several hens are set in one room, it is desirable to confine them in good nests.

Straw and hay make good nesting material.

Broody hens should be moved to the permanent sitting nest at night.

Whole corn is a good feed for sit-

Brooder lamps should be cleaned every day.

A record should be kept of each hatch, showing the date set, number and kind of eggs, number tested out, and the chickens hatched.

Chicks should not receive feed until they are 36 hours old.

In cool weather 10 to 13 chicks are sufficient for one hen, while in warmer weather 15 to 20 can be cared for successfully.

Never mix chicks of different ages.

Confine the hen until the chicks are weaned.

The coop for hen and chicks should be well ventilated, easy to clean, and of sufficient proportions to insure comfort.

The early hatched pullet is the one that begins to lay early in the fall, when eggs are high in price.



A Very Good Feeder.
Note the Short, Thick Neck.



A Poorer Type of Feeder.
Note Crow-like Shape.

ting hens. Water, grit, and dust baths should also be provided.

All eggs should be tested by the seventh day, which often makes it possible to reset some of the hens.

Toe-mark the chicks as soon as they are hatched. This enables one to tell their ages later.

Powder the chicks occasionally during the first eight weeks.

Start the brooder a day or two before putting in the chicks to see that the heating apparatus is working properly.

The cockerel that can be marketed as a broiler in March or April brings more money than the one marketed in June.

Poultry Houses and Fixtures.

Select a location that has natural drainage away from the building.

A dry, porous soil, such as sand or gravelly loam, is preferable to a clay soil.

In most localities the building should face the south, as this insures the greatest amount of sunlight during the winter.

Allow at least 2 square feet of floor space per bird.

Proper ventilation and sunlight mean a dry house and healthy birds.

The partial open-front house is conceded to be the best type for most sections.

The colony plan of housing poultry may be adopted to good advantage on many farms. This system does away with the danger of tainted soil.

The roosts should be built on the same level, 2 feet 6 inches from the floor, with a dropping board about 8 inches below them.

Good roosts may be made of 2 by 2 inch material with upper edges rounded.

The nests may be placed on the side walls or under the dropping boards. It is best to have them darkened, as the hens prefer a secluded place in which to lay.

Feeding.

In order to obtain eggs it is necessary to have healthy, vigorous stock, properly fed.



A "Cripple," or Bird "off feed." Note Eye.

A splendid mixture for laying hens is equal parts of cracked corn, wheat, and oats, which should be scattered in the litter.

Bran or middlings and beef scraps should be kept in receptacles to which the fowls have access at all times.

Plenty of exercise increases the egg yield.

Provide 4 or 5 inches of good, clean litter in which to scatter the grain.

Cabbages, mangels, potatoes, sprouted oats, etc., make excellent green feed.

When wet mashers are fed, be sure they are crumbly and not sticky.

For the first three days chicks may be fed a mixture of equal parts hard-boiled eggs and stale bread, or stale bread soaked in milk. When bread and milk are used, care should be exercised to squeeze all milk out of the bread. From the third or fourth day until the chicks can eat wheat and cracked corn, commercial chick feed is a good ration.

Plenty of pure, fresh water, grit, shell, and green feed should be available from the first day.

There is very little danger of over-feeding young stock.

Feed the chickens about five times daily and only what they will eat up clean in a few minutes, except at



Buff Plymouth Rock, English Type.

night, when they should receive all they want.

Egg Production.

Produce the infertile egg.

Infertile eggs are produced by hens having no male birds with them.

Removing the male bird has no

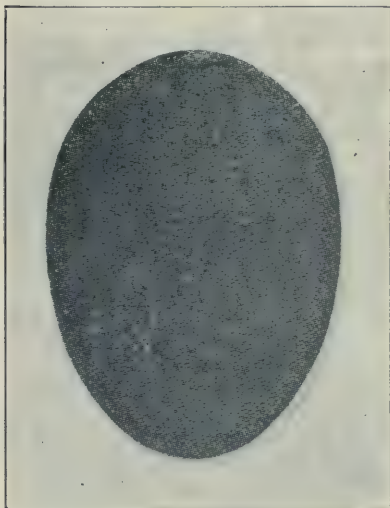
influence on the number of eggs laid by the hens.

The hen's greatest profit-producing period is the first and second years, and unless a hen is an exceptionally good breeder she should be disposed

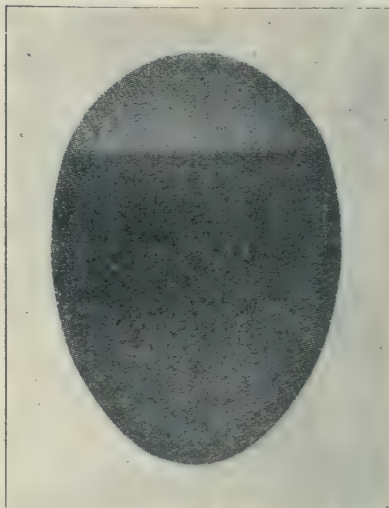
of at the end of her second laying season and before starting to molt.

Few eggs can be expected until the pullets are matured.

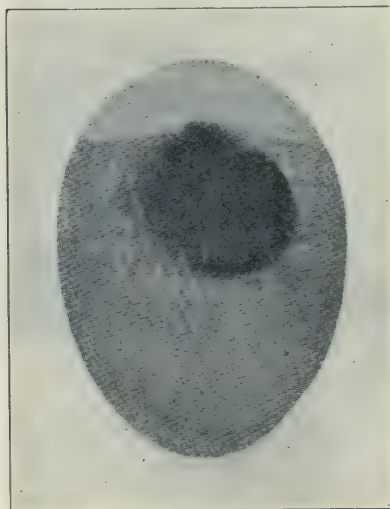
If possible, mark the pullets that lay in the fall, and use them in the



New Laid Egg.
Note Smallness of Air Space.



Shop Egg.
Note Large Air Space.



Musty Egg.
Used in Cooking and Unfit for Boiling.



Another Musty Egg.
Note the Dark Blotch and Large Air Space.

breeding pen for the following spring.

Soft-shelled eggs are often caused by fowls being confined, becoming overfat, and from lack of mineral matter.

Marketing.

Uniform products command the best prices. Purebred fowls produce uniform products.

Begin marketing the cockerels as soon as they weight $1\frac{1}{2}$ pounds or attain a marketable weight.

Market white-shelled and brown-shelled eggs in separate packages.

When selling eggs to the country merchant or cash buyer, insist that the transaction be on a quality basis.

Ship or deliver eggs twice or three times weekly.

Small or dirty eggs should be used at home.

When taking eggs to market they should be protected from the sun's rays.

Infertile eggs will withstand marketing conditions much better than fertile eggs.

Lice and Mites.

The free use of an effective lice powder is always in order.

A dust bath is very essential in ridding the fowls of lice.

In applying powder hold the fowl by the feet, head down, and work the powder well down into the feathers.

The free use of kerosene on the roosts and in the cracks will exterminate mites.

Whitewash is very effective against vermin.

Common Diseases and Treatment.

All diseased birds should be isolated.

Colds and roup.—Disinfect the drinking water as follows: To each gallon of water add the amount of potassium permanganate that will remain on the surface of a dime.

Canker.—Sprinkle a little flowers of sulphur in the mouth and throat of the bird, and put some chlorate of potash in the water. Also carefully remove the exudate with the aid of warm water and apply a 2 per cent. solution of creolin to the diseased tissue.

Chicken pox.—Apply a touch of

iodin and carbolated vaseline to each sore.

Gapes.—New ground and vigorous cultivation will often remedy this trouble.

Scaly legs.—Apply vaseline containing 2 per cent. of creolin to the affected parts, and after 24 hours soak in warm soapy water. Repeat treatment until cured.

Diarrhea in hens.—Low-grade wheat flour or middlings is good for this trouble. Also give teaspoonful of castor oil containing five drops of oil of turpentine to each fowl.

Bowel trouble in chicks.—Well-boiled rice mixed with a little charcoal will often check this complaint. Dissolve 15 grains of crude catechu in each gallon of drinking water.

Rules.

All farmers and poultrymen should adhere strictly to the following rules in handling their poultry and eggs:

1. Keep the nests clean; provide one nest for every four hens.
2. Gather the eggs twice daily.
3. Keep the eggs in a cool, dry room or cellar.
4. Market the eggs at least twice a week.
5. Sell, kill, or confine, all male birds as soon as the hatching season is over.

Candling Eggs.

Eggs are candled very easily. A new-laid egg when held between the eye and the light has a clear appearance, the yolk is practically invisible, and the air cell is about the size of a five-cent piece.

Unless the eggs are put in pickle or held in cold storage, the air cell gradually increases in size, and the yolk becomes visible.

Cold storage and pickled eggs may have small air cells, but the yolks are conspicuous.

The Egg Tester. (See Illustration.)

1. Egg-testing box.
2. Hole through which the light shines and before which egg is held to be tested.
3. Chimney.
4. Bottle of water placed between light and No. 2.
5. Reflector to be placed behind light.

An ordinary lamp or electric light is placed in the box so that the light shines through No. 2. The bottle of

	Eggs	Feed	Egg Sales	Poultry Sales	Home Use	Eggs Set	Chicks Hatched
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Tot'l							

	Eggs	Feed	Egg Sales	Poultry Sales	Home Use	Eggs Set	Chicks Hatched
1							
2							
3							
4							
5							
6							
7							
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30							
31							
Tot'l							

water condenses the light, which makes the testing of eggs a comparatively simple matter.

RULES FOR POULTRY BUILDINGS.

Four to six square feet for every hen. Plymouth Rocks, Wyandottes, nine inches perch room; Leghorns and other light birds, about eight inches; roosts low and near ground.

Dropping boards low down of matched lumber, 20 inches wide for one roost and three feet for two perches. Roosts 2 inches by 2 inches rounded.

Nests 12 to 15 inches square.

Cement floors are the cleanest and best.

Ground floors are better than boards.

Keep only 25 to 30 birds in each flock.

Use matched boards dressed on one side, sheet back on inside, using building paper under the boards.

Specific Suggestions in Regard to the

Proper Care of Market Eggs.

To the Farmer.

Remove the male birds from the flock immediately after the breeding season and market no fertile eggs.

Provide roomy nests and plenty of clean nesting material, preferably dry shavings or cut hay.

Keep the nests clean and sanitary.

Collect the eggs regularly at least once, better twice, a day in moderate weather and more frequently in very

warm and very cold weather.

Remove at once in clean utensils to a cool, dry cellar.

Cover with clean cloth to prevent dust from settling upon them and also to prevent evaporation and fading.

Do not pack loose in a box when taking them to market, but rather secure a suitable egg case and thus avoid breakage.

Market as frequently and as directly as possible.

To the Merchant.

Buy on a loss-off basis, if possible, and encourage other merchants to do the same.

Insist that the farmers furnish first quality eggs only.

Keep in mind the perishable nature of the product and do not hold eggs on a rising market without proper facilities for storing them.

Realize that fresh eggs at any season of the year are much more valuable than stale eggs, when prices are higher.

When shipping, pack carefully in strong, clean cases and fillers.

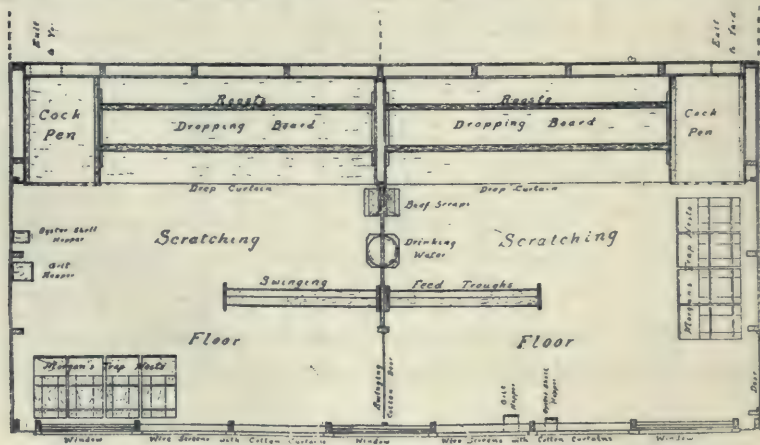
To the Egg-Buyer.

If buying direct from the farmer, make regular and frequent collections.

Pay a premium for quality and do not hesitate to condemn bad, dirty, small and broken eggs.

Encourage the farmer to keep better poultry and more of it.

If buying from the country mer-

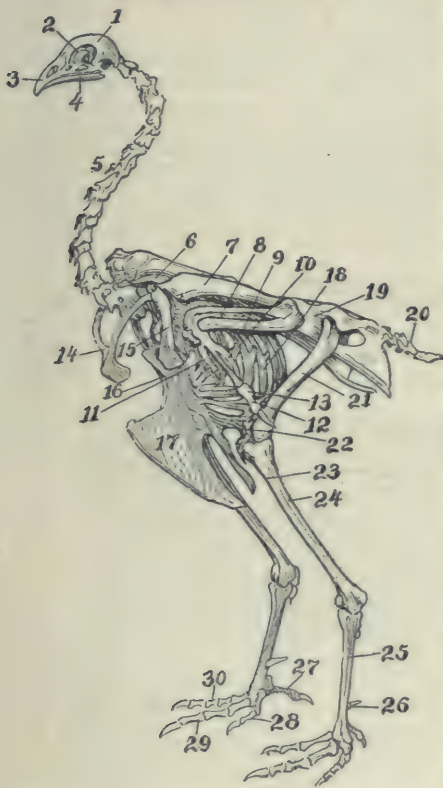


Ground Plan of Hen House for the Farm—Completely Equipped.

and if possible buy on a quality basis.

Be willing to pay a premium for good eggs.

Having purchased eggs do not overlook their perishable nature and give them proper care.



Skeleton of Rooster, Showing Parts of Body.

1, Cranium; 2, septum interorbitale; 3, beak; 4, mandible; 5, cervical vertebrae; 6, scapula; 7, humerus; 8, radius; 9, ulna; 10, metacarpal bone; 11, "thumb" bone; 12, "middle" finger; 13, "third" finger (rudimentary); 14, furcula, fork or "wish bone"; 15, coracoid bone; 16, sternum; 17, crest or keel of sternum; 18, ribs; 19, pelvis; 20, caudal vertebrae; 21, femur; 22, patella; 23, tibia; 24, fibula; 25, metatarsus; 26, spur; 27, hind toe with two joints; 28, inner toe, with three joints; 29, middle toe with four joints; 30, outer toe with five joints. (After Ellenberger.)

Crate Fattening.

Practical experience has shown that crate feeding is not only a very satisfactory, but also an economical method of fattening poultry. The saving in the amount of feed required to produce one pound of gain is quite marked, and the feeder is enabled to observe to greater advantage the progress being made by individual birds. He can also, if necessary, curtail the duration of the feeding period in the case of birds which have attained their maximum weight and are ready to be placed in the finishing crate.

Crate fattening cannot with success be carried on in a haphazard way. The feeder requires to understand the principles of what he is at, and to give the necessary attention to the details of his work. In order to teach the proper method of feeding poultry in crates the Live Stock Commissioner at Ottawa has had prepared a seasonable illustrated pamphlet on the subject, which explains clearly the construction of a fattening crate, the constituents and preparation of proper rations, the methods of feeding, killing and dressing birds, and information regarding packing for market.

Breed and Sitters.

Egg breeds of fowl are as a rule good sitters; meat breed as a rule, non-sitters, and general purpose make good mothers.

Hen Houses.

In this section will be found the plans of suitable hen-houses. The one house is twenty-four feet long and twelve feet wide, and is divided in the centre by a wire and board partition, making two pens, each twelve feet square. The two pens together will accommodate the maximum number of chickens (50) that should be under one roof. The dropping board is constructed of matched lumber, and is placed at the back of the building, about three feet above the floor. The roosts are made of dressed scantling, 3 x 3 inch, about six inches above dropping board. A curtain is arranged to be let down on cold nights in front of the roosts. This house is practically open to the weather at the front, which faces the south. The ends of the house are simply matched lumber. This house chant, encourage frequent shipments

may appear to be cold, but it has been found that too warm quarters for chickens are unhealthy and conducive to disease. There are canvas curtains that can be dropped as a protection during the cold nights.

This house is cheap of construction, and has given excellent results during the laying season. Do not keep hogs too near the hen-house. A cement foundation and a cement floor for the hen-house may seem like an unnecessary expenditure, but it is found to be worth it. The above plans are from Bulletin 189, Ontario Agricultural College.

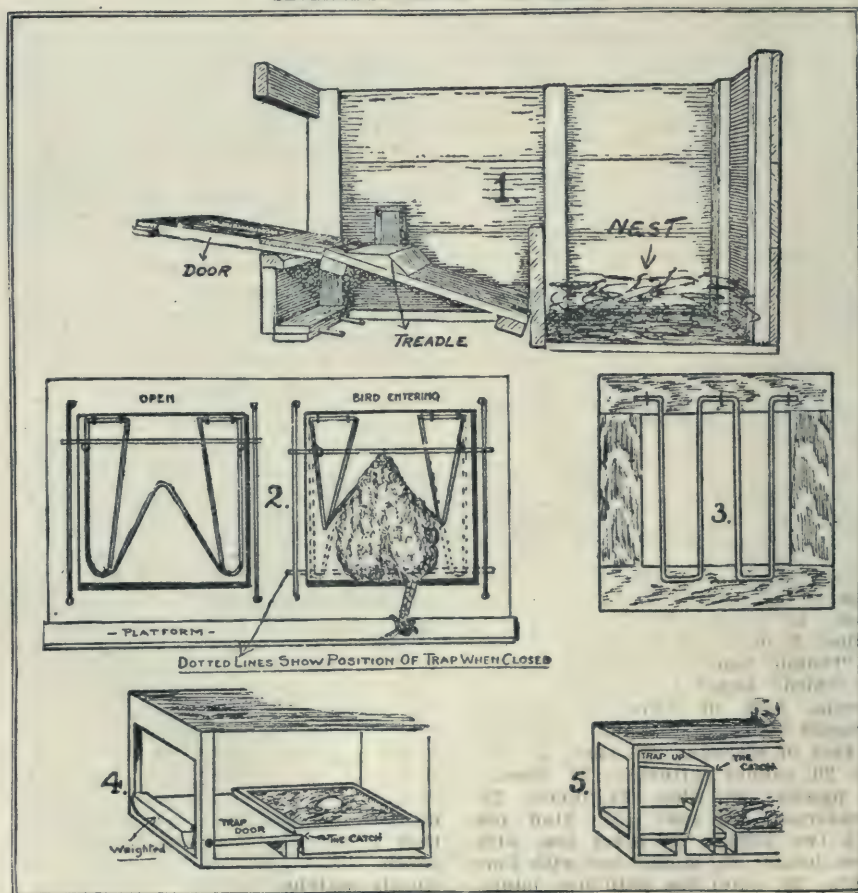
Turkeys, except when very young, should not be cooped up or housed, but allowed wide range to forage.

They will seek and find a great portion of their food. Roosting houses are considered unnecessary by many successful turkey raisers. If used, they must be well ventilated. Turkeys do not reach their full maturity until the third season. Birds should not be used for breeding purposes before their second year.

Concerning the Canadian Egg Trade.

Canada, an agricultural country, imports eggs. Last year over thirteen million dozen eggs were purchased in the United States for consumption in Canada. These eggs were worth nearly three million dollars, and would have, had they been shipped in one consignment, filled

SEVERAL STYLES OF TRAP NESTS.



over one thousand refrigerator cars.

Both the production and consumption of eggs in Canada is increasing, but the consumption is increasing much faster than the production. Three years ago less than a million dozen were imported, but each year since, the quantity has practically doubled.

Imports of eggs into Canada from the United States for the last four years, are as follows:

884,078 dozen during the fiscal year ending March 31st, 1910.
2,378,640 dozen during the fiscal year ending March 31st, 1911. 7,552,248 dozen during the fiscal year ending March 31st, 1912. 13,240,111 dozen during the fiscal year ending March 31st, 1913.

Canada at one time exported eggs. Eleven years ago during the fiscal year ending June 30th, 1902, Canada exported to England, 11,353,825 dozen. The consumption in 1913

therefore exceeded that of 1902 by approximately 25 million dozen. Of course, the population of Canada increased, in that time, but when it is considered that the poultry population has increased proportionately as rapidly as the human population, it is at once evident that today Canadians are eating many more eggs than they did ten years ago. There is undoubtedly, a great opportunity for farmers and other producers to keep more and better poultry, and to take advantage of the increasing demand that there is for prime new-laid eggs.

In addition to the distinct shortage that is apparent in the Canadian egg supply, there is an enormous loss and shrinkage in farm eggs as now marketed.

Eggs are a perishable food product, and the fact that they deteriorate rapidly is evidently often overlooked by producers, buyers, merchants and even consumers. Eggs



Correct Method of Packing for Shipment.

when produced are remarkably uniform in quality, and when marketed should practically all grade new-laid or select. As a matter of fact, however, not over thirty-three or thirty-five per cent. grade new-laid in the

months of July, August and September. Of the remainder, some are stale and shrunken, others are dirty or broken, and in some of the markets as high as 5 per cent. are actually bad and unfit for food.

Standard Varieties of Turkeys.

There are six varieties of turkeys raised in Canada. They are as follows: Bronze Narragansett. Buff, Slate, White and Black. A non-standard variety is the Bourbon Reds. Turkeys originated in America, and were imported into Europe by the Mexicans. Are hard to raise, a peculiarity being that one copulation at beginning of season renders fertile all the eggs in the ovary. Hens weigh 10 to 12 pounds; cocks, 15 to 25 pounds. This is average; many times they are grown many pounds over these weights.

Standard Varieties of Ducks.

There are twelve standard varieties of ducks raised in Canada, some of them on a small scale, as follows: The White Pekin, White Aylesbury, Colored Rouen, Black Cayuga, Colored Muscovy, White Muscovy, Indian Runner, Gray Call, White Call, Black East India, Crested White, and Blue Swedish. Of these varieties, the first seven are considered profitable to raise; the two varieties of Calls and the Black East India are Bantams, and are bred more for the

showroom; the Crested White may be considered as almost purely ornamental while at present but little is known of the Blue Swedish in this country and the United States.

White Pekin Ducks.—Very large, and excellent layers, averaging from 100 to 150 eggs in a season. Non-sitters, easily raised, and mature early. The standard weight of the adult drake is 9 pounds; adult duck, 8 pounds; young drake, 8 pounds, and young duck, 7 pounds.

Colored Rouen Ducks.—Profitable on the farm, hardy, prolific. Eggs not so large as the Pekin, diverse in color. The standard weight of the adult duck is 8 pounds; adult drake, 9 pounds; young drake, 8 pounds; and young duck, 7 pounds.

Black Cayuga Ducks.—Originated in America; produce from 80 to 90 eggs in the spring, and sometimes lay again in the autumn. Standard weight of adult drake, is 8 pounds; adult duck, 7 pounds; young drake, 7 pounds, and young duck, 6 pounds.

Colored and White Muscovy Ducks.—The standard weight of this variety of the adult drake is 10 pounds; adult



A Thrifty Bunch of White Ducks.

duck, 7 pounds; young drake, 8 pounds, and young duck, 6 pounds.

Indian Runner Ducks.—Have been credited with records of more than 200 eggs each in flocks of ten, and of 192 eggs each in flocks of 100. The standard weight of the drake is $4\frac{1}{2}$ pounds, and of the duck 4 pounds.

Gray and White Call Ducks.—Bred for fancy purposes, rather than for profit; not adaptable for the farm. There is no standard weight for this variety.

Black East India.—Very shy in habit, given to long flights, hard to confine. Good sitters. There is no standard size, but the smaller the size the higher they rank for exhibition purposes.

Crested White Ducks.—Medium-sized bird, merely ornamental, the adult drake weighing 7 pounds, and the adult duck weighing 6 pounds.

Blue Swedish Ducks.—Very scarce in Canada. Standard weight of adult drake is 8 pounds, and adult duck is 7 pounds.

Standard Varieties of Geese.

There are seven standard varieties of geese, as follows: Gray Toulouse, White Embden, Gray African, Brown Chinese, White Chinese, Gray Wild, and Colored Egyptian.

Gray Toulouse Geese.—Termed a Christmas goose; a good layer, aver-

aging about 400 eggs in a season. The standard weight of adult gander is 20 pounds; adult goose, 18 pounds; young gander, 18 pounds, and young goose, 15 pounds.

White Embden Geese.—Lay about 200 eggs in a season; very large eyes. Standard weight of adult gander is 20 pounds, and adult goose is 18 pounds.

Gray African Geese.—Considered one of the most profitable to raise. Are ready for market in ten weeks, weighing at that age between 8 and 10 pounds. Very suitable for market and table; weight of adult gander, 20 pounds, and adult goose, about 18 pounds.

Brown and White Chinese Geese.—Very light; are the most prolific of geese, averaging from 50 to 60 eggs a year. Standard weight of adult gander is 12 pounds, and adult goose, 10 pounds.

Gray Wild Geese.—Good layers; highly prized for table use; are hardy and easy to rear. The standard weight of adult gander is 12 pounds, and adult goose, 10 pounds.

Colored Egyptian Geese.—Most beautiful of all varieties; used only for showroom purposes, the adult gander weighing 10 pounds, and adult goose, 8 pounds.

To the Railways and Express Companies.

Handle eggs with care.

Provide suitable accommodation.

Guard against undue exposure to heat and cold.

Deliver with all reasonable despatch to the consignee.

To the Dealers and Packers.

Indicate to the producer that, financially, quality counts for more than quantity.

Adopt without delay a basis of "quality payment." The system of "average payment" on a case count basis permits of a great deal of the carelessness and dishonesty that exists in the egg trade.

If the packers were to adopt the method of "quality payment" in its fullest sense the store-keepers and collectors could not afford to take eggs from producers regardless of quality.

To the Retailer.

Buy eggs of assured good quality.



A Prize Winning Columbian Wyandotte.

If it is necessary to handle inferior eggs, sell them for what they are.

Encourage producers to forward their shipments direct.

Establish if possible, a brand of eggs, which will, in itself be a guarantee of good quality.

Every city retailer must realize how quickly the buying public of the better class proportions its consumption of eggs to the quality of the product. In fact, there is hardly any class of consumers, however

careless, but which will increase consumption when the product is improved.

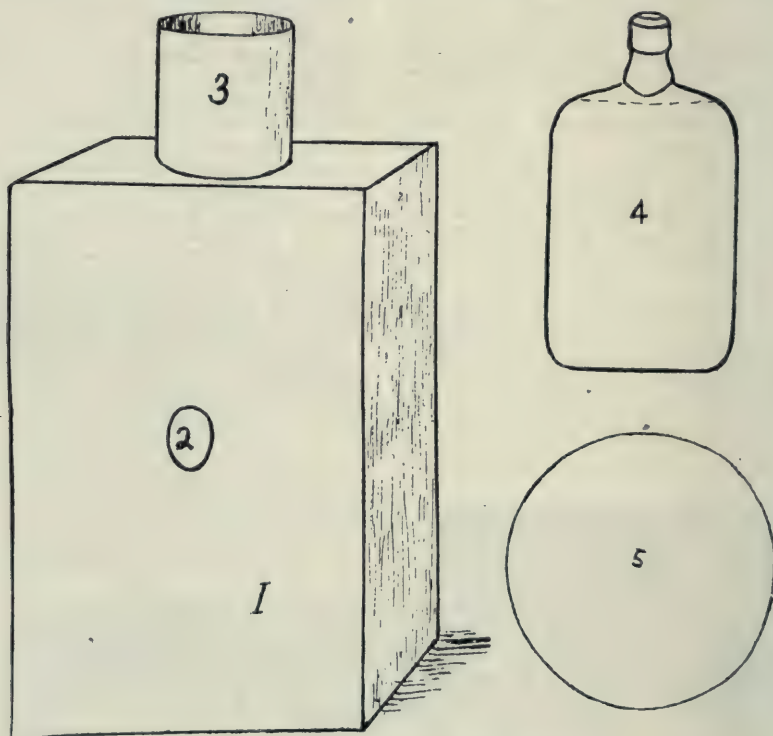
To the Consumer.

Demand new laid eggs of good size and color.

Insist that they be clean.

Learn to distinguish between a new laid egg and a stale egg; a fresh egg and a storage egg.

If bad eggs are furnished, demand retribution.



A Handy Home-made Egg Tester.

1. Egg testing box; 2. Hole through which light shines, and before which egg is held; 3. Chimney; 4. Bottle of water placed between light and egg hole; 5. piece of glass placed behind lamp or reflector.

Keep Up-to-Date

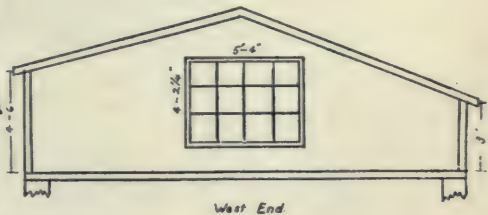
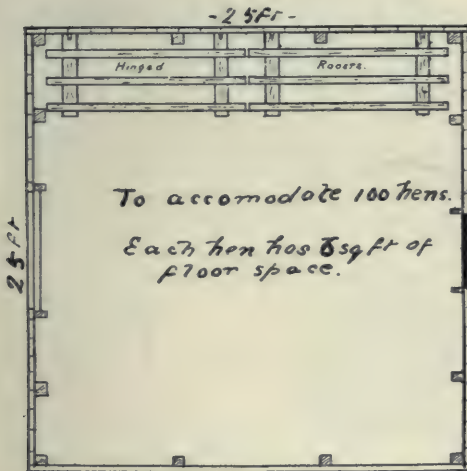
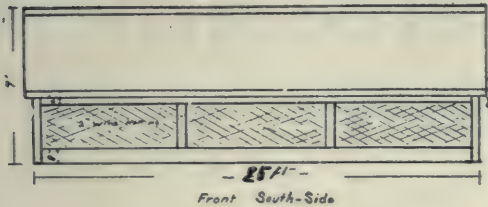
On all Farm subjects, by reading

CANADIAN FARM

Farm Press, Limited, Toronto, Ontario, 12 Wellington E.

This house is inexpensive and has given excellent results as a pen for the average farm. The hens lay well, thrive well and make good weight.

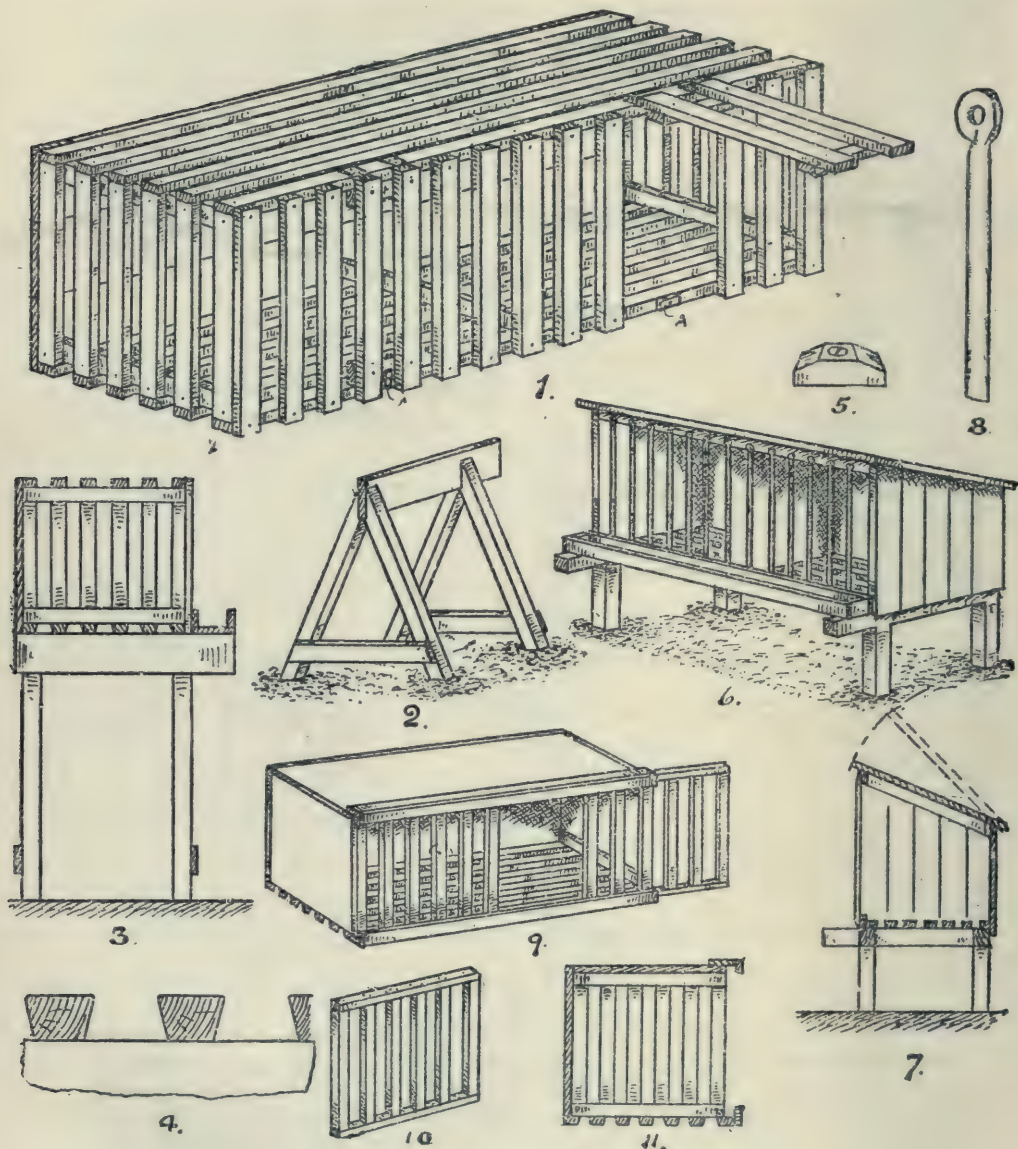
Avoidance of draughts, high site for building, cleanliness, good natural drainage and lots of light are of course necessary accompanying factors.



DETAILS OF PLAN.

The accompanying plan is adaptable on the average farm for the housing of about 100 hens. It allows about six square feet of floor space for every bird. As will be noticed the front is open and wired and is three feet in depth from sill to plate. The back is four feet six in depth from sill to plate; height from peak to plate is seven feet. The house is twenty-five feet square, and has two sets of roosts, about two

feet six from floor. A window is fixed in the west end and the door in the east end. The house faces south and is very comfortable all the year round. The back should be two thicknesses of boards with tar paper between. Curtains of cheese cloth can be attached to be used when the weather is exceptionally cold; these can be stretched on laths and hinged to the plate in front and fastened securely with a thumb screw.



FATTENING COOPS AND CRATES.

Fig. 1—Two compartment fattening coop. Fig. 2—Piece of board projecting at one end to carry food through as shown in Fig. 3. Fig. 4 shows end of bottom bars made narrow at bottom to allow droppings to pass without sticking. Figs. 6 and 7—Useful fattening coops. Figs. 9, 10 and 11 show how to make fattening coops out of ordinary boxes.

HOUSEHOLD

As much depends on baking as on making. Biscuit and gingerbread require a quick oven. Flour bread a slower one.

Fruit cake requires more cooking than a plain sugar cake, and should be baked slowly.

Cookies want a quick oven and close attention or they will burn.

Brown bread a hot oven at first, and a slow, steady fire after the bread is heated all through.

Apple pies should be baked slowly, so that the apples may be cooked through.

In frying doughnuts the lard should be hot enough to cook them quickly or they will soak fat.

THINGS WORTH KNOWING.

To beat the whites of eggs quickly, put in a pinch of salt. The cooler the eggs, the quicker they will froth.

In boiling eggs hard, put them in boiling water ten minutes and then put them in cold water. This will prevent the yolks turning black.

Old potatoes may be freshened by plunging into cold water before cooking.

Rub your griddle with fine salt before you grease it, and your cakes will not stick.

Take out the little balls in the head of cloves before using, as that is what discolors your fruit.

To cut hard butter into squares, fold a piece of waxed paper in which the butter was wrapped around the knife. You can then make a perfectly smooth cut.

In preparing chicken or turkey for roasting, try rubbing the inside with a piece of lemon. It will whiten the flesh and make it more tender.

MEASURES OF CAPACITY.

Four even teaspoonfuls liquid, equal one even tablespoonful.

Three even teaspoonfuls, dry material, equal one even tablespoonful.

Sixteen even tablespoonfuls, liquid, equal one cupful.

Twelve tablespoonfuls, dry material, equal one cupful.

Two cupfuls, equal one pint.

Four liquid cupfuls, equal one quart.

Four cupfuls flour equal one quart or one pound.

Two cupfuls solid butter, equal one pound.

Two cupfuls granulated sugar, equal one pound.

Two and a half cupfuls powdered sugar, equal one pound.

One pint of milk or water, equals one pound.

One pint chopped meat, packed, makes a pound.

One cup rice equals one-half pound.

One cup stemmed raisins, makes 6 ounces.

TABLE OF PROPORTION.

One quart of flour requires one pint of butter, or butter and lard mixed for pastry.

One quart of flour requires one heaping tablespoon of butter for biscuit.

One quart of flour requires one cup of butter for cup cakes.

One quart of flour requires one-half level teaspoon of salt.

One quart of flour requires four teaspoons of baking powder.

One quart of flour requires one pint of milk for muffins, gems, etc.

One quart of flour requires one scant quart of milk for batters of all kinds.

One measure of liquid to three measures of flour for bread.

One teaspoon soda to one pint sour milk.

One teaspoon soda to one cup of molasses.

One teaspoon salt to one pound of meat.

A spoon means that the material should lie as much above the edge of the spoon as the bowl sinks below it. A heaping spoon means that the material should be twice as high above the edge of the spoon as the bowl sinks below it. A level teaspoon should hold 60 drops of water.

All dry materials should be measured after sifting.

A spoon of salt, pepper, soda, and

spice is a level spoon.

One-half of a spoon is measured by dividing through the middle lengthwise.

CANNED FOR HOME USE.

Cocoanut matting may be cleaned with a large, coarse cloth, dipped in salt and water and then rubbed dry.

Verdigris on metal can be quickly removed by rubbing with a soft rag dipped in ammonia.

If a cane or willow chair or table has dried out and become tightened, wet it with salt water and dry it in the sun.

To clean a copper kettle, rub its surface with lemon and salt. Wipe the surface quickly and rub with a dry chamois skin.

Kitchen Hints.

Average quantity of nutritive matter in 1,000 parts of varieties of animal and vegetable food:—

Cucumber	25
Melons	30
Turnips	42
Milk	72
Cabbage	73
Carrots	98
White of egg.....	140
Beet root	148
Pears	160
Apples	170
Haddock	180
Gooseberries	190
Peaches	200
Codfish	210
Sole	210
Pork	240
Cherries	250
Veal	250
Beef	260
Potatoes	260
Apricots	260
Grapes	270
Chicken	270
Plums	290
Mutton	290
Tamarinds	340
Almonds	650
Oats	742
Rye	792
Rice	880
Barley	920
Wheat	950

Water.

The most common as well as most effectual method for purifying water is to boil for twenty minutes. Boiling water causes it to lose its carbonic acid, and this is the reason boiled water tastes flat and insipid. By pouring the water from one vessel to another, it will absorb a certain amount of gases again, and thus the flavor will be improved.

Temporary hardness of water can be removed by adding to the water one-tenth of its volume of lime-water. For washing purposes, permanent hard water may be softened by adding a little sal-soda.

For purifying water of organic matter, anything added that will coagulate the material will serve. Oak chips, alum, and certain kinds of nuts will do this. Any one of the above remedies should be used to purify water coming from marshy lands, ponds, and polluted rivers. A handful of oak chips to two gallons of water, or seven grains of alum to a gallon of water, will serve the purpose. After water has been purified by this method it should be filtered by straining through a flannel cloth. The cloth must be cleaned every day.

If Sink Drain be Choked.

Pour into sink 1-4 lb. of copperas dissolved in two quarts of boiling water. If the result is not successful, repeat before sending for a plumber.

To Make Gravy a Good Color.

Brown flour makes delicious brown gravies. Put flour in a pieplate and set on top of the stove, or in a very hot oven. It should be constantly stirred until brown all through. Put in jars and keep for use.

Cider for Winter Use.

To keep cider sweet for mince-meat, boil it down to one-half or two-thirds of the original quantity and seal in glass jars as you would fruit.

Keep Your Groceries in Tins.

USEFUL HINTS.

A soft rag, moistened with lemon juice and then dipped in silver whitening will be found excellent for cleaning piano keys.

A mixture of olive oil and ink in equal parts is excellent for removing the rusty appearance from swede shoes or slippers.

Keep small squares of coarse sand paper near the kitchen sink. There is nothing better for removing scorch or food stuffs from pots or pans.

A plain cloth dipped in hot water and then in a saucer of bran, will clean white paint and not injure it. The bran acts like a soap on the paint.

Often a machine needle, which has a turned or blunted point may be made as good as ever by rubbing it back and forth a few times on a whetstone.

In cleaning woollen clothes in winter time, take them out of doors, throw dry snow over them and then brush it off. This not only removes dust but lint.

If a strong brine of salt and water is thrown over the coals, less soot will collect in the flues and chimneys. The fire, too, will burn clear and bright.

To remove hot water marks from japanned trays use sweet oil. Rub it in well till all marks disappear, then polish the tray with dry flour and a soft cloth.

Leather can be cleaned very well with milk. Dust the leather thoroughly with a soft cloth, then use another cloth dipped in sweet milk and the spots will be easily removed.

Kerosene rubbed on with a soft cloth will clean zinc perfectly. Kerosene or gasoline applied with a cloth will also remove all grease spots from porcelain basins and bath tubs. Rinse well with very hot water.

If a pan in which milk is cooked is rinsed out in cold water, the milk will not be so apt to stick.

If one burns the food in a new white enamel dish, put into the dish a tablespoonful of sal soda, fill with water and boil.

If one has not access to a hot water bag when it is needed, a good substitute is a flannel bag filled with hot sand or salt. A good idea is to keep

Dye Your Clothes With

DY-O-LA

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The Johnson-Richardson Co., Ltd.

74 Antoine Street

MONTREAL

Don't Miss This Valuable Wash-Day Suggestion

Just a few drops of "J-R BLUE" in your Bluing Tub on Monday will make your Clothes as 'White as Snow,' Without a Spot or Streak. It cannot settle. Don't Fail to Try It! You will be Delighted with it.

"J-R BLUE" is 10 cents a package, and lasts Six Months. Buy a package To-day for Monday's washing. If your Grocer does not happen to have it in stock, don't put off using it on that account. The Johnson-Richardson Co., Limited, 74 St. Antoine St., Montreal, Can., will mail it to you Promptly, postage paid, on receipt of price.

a half dozen little ones filled and ready.

Get a nickel's worth of stick glue at your druggist's and put three or four pieces at intervals in the soil around your fern. Do this three or four times a year and you will notice a marked improvement in the plant.

If new enameled saucepans are placed in a pan of warm water, allowed to come to a boil and then cooled, they will be found to last much longer before either cracking or burning.

White spots on furniture will disappear if a hot plate from the stove be held over them.

CANNING.

The proportions of sugar and fruit used in canning and preserving vary greatly. The amount of sugar given below is about an average for canning when a very rich preserve is not desired. These canned fruits are excellent for pies, etc.

Sugar to a Quart Jar.

Cherries 6 ounces

Strawberries	6 to 8	"
Raspberries	4	"
Blackberries	5 to 6	"
Quinces	8 to 10	"
Pears	4 to 6	"
Grapes	6 to 8	"
Peaches	4	"
Pineapples	4 to 6	"
Crabapples	6 to 8	"
Plums	4	"
Pie-plant	8 to 10	"

LAUNDRY.

Liquid Starch.—One-half pound starch, one ounce borax, three table-spoons turpentine, one gallon soft water. Use cold. Stir well before taking out. It will give the clothes a fine polish and does not stick.

Colored Ribbons.

For washing colored ribbons make a strong lather of white soap and cold water. Wash the ribbons in this lather, allowing it to be quite cold; rinse in clean water several times, always having the water a little soapy, and when nearly dry iron between thin pieces of muslin.

SUSTENANCE FOR THE SICK.

Beef Tea.—Mince one pound of good lean beef and put into a jar with one teacupful cold water; cork closely and set in a boiler or steamer to cook. It will require three or four hours. Strain and season.

Beef Essence.—Put one pound of lean beef, minced fine, into a jar, without any water whatever, cover the jar tightly and set it in a pot or kettle of cold water, bringing the water slowly to a boil and allowing the jar containing the meat to so remain simmering until the juice of the meat is all extracted and the fibre becomes colorless. Season to taste and skim when cold.

Barley Water.—Put two ounces of pearl barley into half a pint boiling water and let it simmer a few minutes. Drain off and add two quarts of boiling water with a few figs and stoned raisins cut fine. Boil slowly until reduced about one-half and strain. Sweeten to taste, adding the juice of a lemon and nutmeg if desired.

Toast Water.—Brown nicely, but do not burn, the slices of bread, and pour upon them sufficient boiling water to cover. Let them steep until

cold, keeping the bowl or dish containing the toast closely covered. Strain off the water and sweeten to taste, putting a piece of ice into it as drank.

Flaxseed Lemonade.—Pour on four tablespoonfuls of whole flaxseed one quart of boiling water and add the juice of two lemons. Let it steep for three hours, keeping it closely covered. Sweeten to taste. Excellent for colds.

Slippery-Elm Bark Tea.—Pour boiling water over the bark, first breaking it into bits; cover the pitcher containing it and let it stand until cold; add lemon juice if desired and sweeten to taste.

Mulled Buttermilk.—The well-beaten yolk of an egg added to boiling butter-milk and allowed to boil up; or add to the boiling butter-milk a little thickening of flour and cold buttermilk.

Baked Milk.—Put the milk in a jar, covering the opening with white paper, and bake in a moderate oven until thick as cream. May be taken by the most delicate stomach.

Onion Gruel.—Boil a few sliced onions in a pint of fresh milk, stirring in a very little oatmeal and a pinch of salt; boil until the onions become tender and take at once just before going to bed. Excellent for a cold.

Arrowroot.—Use milk or water as preferred. Put a heaping teaspoonful of ground arrowroot into a cup and mix with a little cold milk. Stir into a pan containing a pint of either cream or water that has been brought to a boil, adding a little salt. Let it simmer for a few minutes and then pour out. May be sweetened or flavored with grated nutmeg if desired. Should be made only as it is wanted.

Herb Teas.—Made by infusing the dried or green stalks and leaves in boiling water and letting stand until cold. Sweeten to taste.

UTENSILS IN THE KITCHEN.

In the furnishing of a home if there is one place that is neglected, it is the kitchen, as far as having utensils for making work lighter and easier is concerned. I cannot think the fault comes all from a lack of money as much as from lack of know-

ledge of the proper use of things. Utensils should be selected with as much care and thought as one would give to any other furnishings of the home. If the family is small, select small utensils, each with some definite purpose in view.

Of all the wares on the market, agate or aluminum are the most satisfactory, for they are light, durable, and easily cleaned and can be found in almost every article manufactured. Iron is durable, but heavy, and when not in use for a long time should be protected by oily or waxy surfaces to keep from rusting.

Acids should never be used in anything except glass, porcelain or granite. French chefs use copper and brass utensils, but they are very expensive, must be kept scrupulously clean, as they are easily affected by acids or alkali and all their salts are poisonous. Cleaned most easily with oxalic acid. Ammonia dissolves copper or brass.

Zinc is attacked by acids and alkali.

Lead is attacked by salt or any organic material. Organic matter in water causes the objection to lead pipes.

It is the lead in the solder that causes the objection to canned goods.

Sulphuric acid will clean spots caused by salt water. None of its salts are considered poisonous.

Bright surfaces retain heat, therefore all utensils to keep liquid hot must be bright as possible.

TIME FOR BAKING.

Loaf Bread	40 to 60 minutes
Rolls and Biscuit	10 to 20 "
Graham Gems	30 "
Gingerbread	20 to 30 "
Sponge Cake	45 to 60 "
Plain Cake	30 to 40 "
Fruit Cake	2 to 3 hours.
Cookies	10 to 15 minutes
Bread Pudding	1 hour.
Rice and Tapioca ..	1 hour.
Indian Pudding	2 to 3 hours.
Steamed Pudding ..	1 to 3 hours.
Steamed Brown Bread	3 hours.
Custards	15 to 20 minutes
Pie Crust	about 30 "
Plum Pudding	2 to 3 hours.

This applies to young and fresh vegetables.

TIME FOR SUMMER VEGETABLES.

Greens—Dandelions	1½ hours.
Spinach	1 hour.
String Beans	2 hours.
Green Peas	20 minutes
Beets	1 to 3 hours.
Turnips	1 to 3 hours.
Squash	1 hour.
Potatoes	½ hour.
Corn	¾ hour.
Asparagus	½ hour.

TIME FOR WINTER VEGETABLES.

Squash	1 hour.
Potatoes	½ hour.
Potatoes, baked	1 hour.
Sweet Potatoes	¾ hour.
Baked Sweet	1 hour.
Turnips	2 hours.
Beets	3½ hours.
Parsnips	1 hour.
Carrots	1½ hours.
Cabbage	3 hours.

TIME FOR BROILING.

Steak, one inch thick ...	4 to 6 min.
Steak, two inches thick ..	8 to 15 min.
Fish, small and thin	5 to 8 min.
Fish, thick	15 to 25 min.
Chickens	20 to 30 min.

TIME FOR MEATS.

Beef, underdone, per pound	9 to 10 min.
Beef, fillet of	20 to 40 min.
Mutton, leg, per pound.	10 to 12 min.
Mutton, stuffed shoulder per pound	18 min.
Veal, loin of, plain, per pound	15 to 18 min.
Veal, stuffed	20 min.
Pork, spare rib, per pound	15 to 20 min.
Pork, loin or shoulder, per pound	20 to 30 min.
Liver, baked or braised.	1 to 1½ hrs.
Corned beef, per pound.	25 to 30 min.
Boiled (simmered) Beef, per pound	20 to 30 min.
Ham, after water or cider begins to boil ..	15 to 20 min.
Bacon, per pound	15 min.
Chickens, baked, three to four pounds	1 to 2 hrs.
Turkey, ten pounds ...	3 hrs.
Goose, eight pounds ...	3 hrs.
Duck, tame	40 to 60 min.
Duck, wild	30 to 40 min.
Grouse, Pigeons and other large birds ...	30 min.
Small birds	10 to 15 min.
Venison, per pound ...	15 min.

Fish, long and thin,
six to eight pounds.. 1 hr.
Fish, thick, six to
eight pounds $1\frac{1}{2}$ to 2 hrs.
Fish, small 25 to 30 min.

TABLE OF MEASURE.

A speck makes one-quarter salt-spoon.

Four saltspoons make one tea-spoon.

Three teaspoons make one table-spoon.

Eight tablespoons of dry and solid material make one cup.

Sixteen tablespoons of liquid material make one cup.

Two gills make one cup.

One wine glass makes one-half gill.

One cup contains eight ounces of liquid.

Ten eggs, average size, make one pound.

One-half ounce bottle extract makes twelve teaspoons.

One tablespoon butter makes one ounce.

One tablespoon granulated sugar makes one ounce.

One heaped teaspoon powdered sugar makes one ounce.

One tablespoon flour makes one-half ounce.

Two tablespoons ground spice make one ounce.

Five nutmegs make one ounce.

One quart sifted pastry flour makes one pound.

One quart, less one gill, sifted patent flour makes one pound.

One scant pint granulated sugar makes one pound.

One pint butter makes one pound.

One pint chopped meat, packed, makes one pound.

One cup rice makes one-half pound.

One cup cornmeal makes six ounces.

One cup stemmed raisins makes six ounces.

One cup cleaned currants makes six ounces.

One cup stale bread crumbs makes two ounces.

HEALTH HINTS.

Fresh air is most essential to keep the body healthy, and therefore very necessary to good looks. Bedroom windows should be open all night long. Fresh air injures no one's

health. Draughts are dangerous. Even during the winter, windows of all rooms should be thrown wide open for a short time to allow fresh air to play through them. A room aired in this way will save fuel, and heat up much quicker. Stale air is harder to heat than pure air.

Poisons.

Poisons may be classified according to their treatment under two heads:—

(1) Those which do not stain the mouth, in which cases an emetic is to be given:

Poisonous meat.

Fish.

Fungi (mistaken for mushrooms).

Arsenic.

Phosphorus.

Alcohol (which may cause collapse).

Oil of Vitriol.

Opium.

Morphia.

Laudanum, etc.

Give an Emetic. (Make the patient vomit.)

Suggestions for Emetics.

(a) Mustard—A dessertspoonful in a tumbler of lukewarm water.

(b) Salt—A tablespoonful in a tumbler of lukewarm water.

(c) Mix together 1 teaspoonful salt, 1 teaspoonful mustard in a cup of warm water.

(d) Ipecacuan wine—For a child, a teaspoonful, repeated at intervals of fifteen minutes. (Not to exceed 3 or 4 doses.)

(2) Those which burn and stain the mouth, in which case no emetic is given, as this would make the patient sick and burn the throat again as it came up:

Acids, such as—

Nitric acid.

Hydrochloric acid.

Sulphuric acid.

Spirits of Salt.

Carbolic acid.

Oxalic acid.

Salts of Lemon, etc.

Give immediately white of egg, or

lowed by milk and Epsom salts.

For Laudanum, Morphine and Opium.

These make a patient drowsy. Give an emetic; then strong tea or coffee. Don't let him sleep. Walk him up and down. Slap and punch him to keep him awake.

A few of the commoner of these are:—

(1) Carbollic acid. (No emetic.) First give flour and water, etc., followed by milk, to which has been added Epsom salts in the proportion of 1 oz. of salts to a pint.

(2) Poisonous Meat, Fish and Fungi (supposed mushrooms).

1. Give an emetic.

2. When emetic has acted, give castor oil.

3. Keep patient quiet and warm.

(3) Paris Green. (No emetic.) Give plenty of milk, a raw egg beaten up, and as soon as possible an emetic. Mustard and water is as good as anything. Keep up the vomiting by giving milk between paroxysms of vomiting. When stomach no longer rejects what is swallowed, give castor oil.

Poison Ivy.

If taken in the first stages, when the small blisters begin to rise, poison ivy can often be cured with sweet spirits of nitre. Bathe with the spirits of nitre constantly. Use a soft rag and dab it on. (Be careful not to rub the blisters.) This should be done many times through the day and night. If some 48 hours old, use:

Carbollic acid—20 drops.

Glycerine—1 ounce.

Rosemary water—1-2 ounce.

Bathe the affected parts until they disappear.

Slings of Venomous Insects.

Apply weak ammonia, oil, salt water or iodine; or apply a coating of earth softened into a plaster with water.

Snake Bites.

Turpentine should be put in a

bottle and the mouth placed over the spot; the liquid brought directly in contact with the wound by inverting the bottle. Hold there until relief is obtained. It has been known to take not longer than fifteen minutes.

Mad Dog or Snake Bite.

Tie a cord above the wound. Suck the wound and cauterize with caustic or white-hot iron at once. Otherwise, cut out the adjoining parts with a sharp knife. Give a stimulant, such as whiskey, brandy, etc.

Help in Case of Accidents.

Burns and Scalds.—Cover with cooking soda, and lay wet cloths over it; white of eggs and olive oil; olive oil or linseed oil, plain, or mixed with chalk or whitening. It is wise to keep always in the house a bottle of "Carron oil" ready mixed. This is made by mixing equal parts of linseed or olive oil and lime water. Burns of all kinds must be protected from the air.

Sunstroke.—Loosen clothing and get patient into shade. Dash cold water over the face and head. Apply ice or ice cloths to the head, and give a teaspoonful of spirits of sal volatile (aromatic spirits of ammonia) in water. Falling this, two teaspoonfuls of ginger in half a tumbler of water. Keep head in an elevated position.

Lightning.—Dash cold water over the person struck.

Fish-Bone in Throat.—Swallow a raw egg.

Convulsions in Children.

(1) Place the child in a warm bath slightly above the temperature of the body (90 degrees), so that the water reaches the middle of the trunk. Then place a sponge dipped in cold water on the top of the head.

Cure for Chafing Babies.

Thinly-made boiled starch applied to the parts where damp napkins have caused soreness. This will give relief in a short time.

Cure for Indigestion and Wind in Infants.

Soda Mint—

Bicarbonate of soda—1-2 drachm.

Aromatic spirits ammonia—1-2 fluid drachm.

Spearmint water or peppermint water, 2 fluid ounces.

1 teaspoonful in hot water at 1 year of age.

Biting Fingernails.—Get a small quantity of bitter aloes in the form of a paste and rub onto the top of the nails. The habit will be broken in less than two weeks.

Fire in One's Clothes.—Don't run, especially not downstairs or out of doors. Roll yourself in a carpet or wrap, woolen rug or blanket. Keep the head down, so as not to inhale flame.

Fire from Kerosene.—Don't use water. It will spread the flames. Dirt, sand, or flour is the best extinguisher; or smother with woolen rug, table cover or carpet.

Suffocation From Inhaling Illuminating Gas.

Get into the fresh air as soon as possible and lie down. Keep warm. Take ammonia—

20 drops of ammonia to 1 tumbler of water.

Take this at frequent intervals; also—

2 to 4 drops of tincture of nuxvomica every hour or two for five to six hours.

Cinders in the Eye.—Roll soft paper up like a lamplighter, and wet the tip, to remove; or use a medicine dropper to draw it out. Rub the other eye.

Fainting.—Lay the patient on the back with the head low. Raise the lower limbs; loosen the clothing and allow fresh air.

Boracic Acid.

Boracic acid should be kept in every home. To every 1-2 pint of boiled water add 1 teaspoonful of boracic acid. It is safe to be used in all cases of inflammation:—

(1) To gargle sore throats.

(2) To bathe inflamed eyes.

(3) Also to bathe cuts, cold sores, etc.

Advice.—Keep medicines out of the reach of children; if possible, in a locked chest. See that all poisons are in three-cornered bottles, or at least have a pin through the cork, the point sticking up. These can then be unmistakable, even in the dark.

A Cure for Constipation.

1-4 lb. seeded raisins.

1-4 lb. figs.

1-4 lb. prunes.

1-4 lb. dates.

1 or 2 tablespoons of Alexandria Senna.

Stew prunes gently without sugar. Pour off juice. Chop all together finely, and mix the powdered senna in evenly. Put in a crock or jar, and take as required. A piece the size of a walnut on going to bed, or more.

LAUNDRY.

1 qt. warm water.

1 can of Gillett's lye (10c. size).

1-2 cup household ammonia.

4 teaspoonfuls borax.

2 tomato tins of greas.

Mix water, lye, ammonia and borax together. When dissolved, stir in the grease (melted and warm—not too hot), and keep stirring until the thickness of thick cream. Pour into a large baking tin and make into squares before too hard to cut.

A Good Washing Fluid.

1 lb. of sal soda.

1-2 lb. unslaked lime.

1 gallon of water.

Boil twenty minutes; let stand till cool; then drain off and put in a small jug or jar. To one boilerful of clothes, which have been soaked and soaped, add a teacup of washing fluid. The clothes must be well covered with water before adding the fluid, and must boil about half an hour. Wash in suds and rinse. This receipt is an invaluable saver of time.

Soap Jelly for Washing Flannels.

Save the small pieces of laundry, toilet and bath soap until you have a teacup full. Put them into a quart of hot water with a tablespoonful of kerosene. Let simmer until dissolved. Make warm suds with this soap jelly. Set your flannels in the usual way. They will come out clean and soft.

White Clothes That Have Turned Yellow.

Can be beautifully bleached by soaking in buttermilk. If necessary, you can leave them in buttermilk twenty-four hours.

Your iron will not stick if you do one of two things:—

(1) Add 1 tablespoonful of salt to 1-2 gallon of starch; or

(2) 1 tablespoonful of kerosene oil put into the cold starch.

These give a pretty gloss.

Colored Cottons.

Put a small quantity of Maypole Soap into the rinsing water, and your cotton gowns will always look fresh and new.

Black and Navy Blue Linens.

Wash and peel two potatoes. Grate them into soft tepid water. Add 1 teaspoonful of ammonia. Wash goods in this and rinse in cold blue-water. Dry, and iron on the wrong side.

An infusion of hay will preserve buff linens.

An infusion of bran will preserve brown linens.

Tussore and Raw Silks.—Should not be ironed until quite dry.

Blankets.

Use a little soap in the last rinsing water. After they have been hung on the line and are thoroughly dry, beat with a carpet-beater. They will become soft and light, and the wool like new.

To Wash Muslins and Gingham.

Dissolve a piece of alum the size of a nut to every pt. of starch. The color will keep bright a long time. This hint is useful when dresses must be often washed.

To Wash Feather Pillows or Eider-downs.

Choose a bright, windy day. Fill the washtub with hot suds and plunge the pillows (with the feathers) into the suds. Put into several waters, shaking about briskly. Hang on the line in warm, fresh air. Never put directly in the hot sun, as it draws oil out of the feathers and gives them an unpleasant odor.

Black Cashmere.

Wash in hot suds with a little borax in the water. Rinse in blue—very blue—water. Iron while damp. If carefully done, the material will look like new.

To Remove Stains.

(1) Handkerchiefs and napkins often become stained. If possible, procure Javelle water from a drug store. Wet the stains before the articles are put in the wash. They will vanish.

(2) Make a solution of 4 oz. of chloride of lime; put into a quart bottle of water. Shake thoroughly and allow dregs to settle. The clear water will remove the stain. Rinse thoroughly before it comes into contact with soap.

Paint Stains.—Equal parts of ammonia and spirits of turpentine will take paint out of clothing no matter how dry or how hard it may be.

Kerosene will remove fresh paint.

Ink Stains.—In carpets or woollen goods. If done at once, nothing is better than milk. One may pour milk on to the stained surface of the most delicate carpet or woollen goods. Rub the milk in and repeat until it is no longer discolored. Then wash with warm water.

(2) Take common baking soda and rub well into the spots, and then rinse with warm water.

Grass Stain.—(1) Rub the article stained with alcohol. Then wash in clean water.

(2) In white clothes. Tie a piece of washing soda up in the stained part of the garment before putting it into the boiler.

To Remove Rust.

(1) Saturate the spot with lemon juice; then cover with salt. Let stand in the sun for several hours.

(2) Cover spots with salts of lemon and pour over it boiling water. Mud Stains.—Allow to dry thoroughly; brush; rub spots with alcohol.

INSECTS AND THEIR ERADICATION.**To Exterminate Fleas.**

1-2 lb. of Persian insect powder.

1-2 lb. of powdered borax.

1 oz. oil of cedar.

1-4 oz. oil of pennyroyal.

This mixture should be put up by a druggist. Close the room tightly. Sprinkle this powder on carpet, furniture and beds. Keep the room closed for twenty-four hours. Then open all windows and air thoroughly. There will be no fleas, flies or mosquitoes left. The room can be swept and dusted. This applies nearly as well to roaches and waterbugs.

Mosquito Remedy.

To clear a sleeping-room of mosquitoes, take paper, roll it round a lead pencil to form a case, and fill with pyrethrum powder (Persian insect powder). Put in little at a time and press down with a pencil. Set this "tube" in a cup of sand to stand erect. An hour before bedtime, close the room and light the "tube." For a small room, one is sufficient; for a large room, use two. This method is very effective.

Ways to Destroy Ants.

(1) Scrub the shelves and drawers with strong carbolic soap; sprinkle oil of pennyroyal on cotton batting, and put in the places ants frequent.

(2) A small bag of sulphur kept in a drawer or cupboard, or a saucer of olive oil set where they are, will drive them away.

(3) Red ants can be banished by strewing the shelves with whole cloves. The cloves should be renewed occasionally, as they lose strength and decay.

(4) Tie a cord dipped in kerosene oil round a sugar barrel. It wet with oil every few days, it will keep them away.

To Destroy Cockroaches.

If powdered borax (with a little sugar) is scattered freely where the roaches go, it will not only prevent them coming, but also destroy them. In damp and dark closets, under sinks and wash basins, they make their hiding places. Nothing but persistent care and neatness will rid one of cockroaches.

To Exterminate Bedbugs.

(1) Shut the windows tightly. Leave all clothing in its place, and open trunks and drawers. Put a thick layer of ashes into an iron kettle, on which place live coals. Have no obstacles between yourself and the open door. Put a handful of sulphur on the coals and immediately close the room, leaving it undisturbed for several hours. When opened, the room and contents can be aired and the odor will soon be gone. It is rarely that a second fumigation is necessary.

The same method will destroy moths.

(2) Blue ointment and kerosene mixed in equal proportions and applied to bedsteads is an unfailing bug remedy. A coat of lime whitewash is ditto to a log house.

(3) Procure at the druggist's—

Oil of pennyroyal, 1 drachm.

Turpentine, 8 ounces.

Kerosene oil enough to make 1 gallon.

This is a good bedbug exterminator.

Moths in Carpets.

Turn your carpet back about half a yard all round the room. Wash your boards with a saturated solution of camphor. Put it on with a paintbrush. Lay the carpet back, and put over it a towel wrung out of water and camphor. Iron thoroughly

with a very hot iron. This will steam

The Floors.

Carpet-covered floors belong in a great measure to the past. Here are some hints on the treatment of floors:

First, scrub your floor, and when quite dry fill in the cracks with the following:

Filling for Cracks in Floors.

Soak newspapers in a paste made of 1 lb. flour, 3 qts. water, 1 tablespoonful of alum.

Thoroughly boil the mixture until about the consistency of soft putty. Fill in the cracks and it will harden like papier-mache.

To Color Floors Walnut Tint.

(1) Procure 1-4 lb. of burnt amber (in powder form). If a darker shade is required Vandyke brown; or blend different shades until you get the color required. Mix the powder with turpentine or kerosene oil, and then add 1-2 gallon of boiled linseed oil. This quantity will cover a large surface. Apply with a paintbrush, and rub in well with a rag. When dry with floor polish.

Floor and Furniture Polish.

(1) 2 ounces beeswax.

it through and through, and will kill the insects and their larvae.

To Keep Moths from Winter Clothes.

Housewives should give up one cupboard for the putting away of winter clothes. The clothes must be hung out on a sunny day and be well beaten. The cupboard should be scrubbed and sprinkled with good black pepper and insect powder. Hang up the garments and close the door. Renew the pepper once a month.

Furs.—Sprinkle them thoroughly with black pepper. Then wrap in newspapers so that no air penetrates. Be sure there is no tear in the paper. Moths cannot cut through printer's ink without dying. Therefore safety is assured.

1-2 pint turpentine.

Shave up your beeswax and put in a tin basin with the turpentine. The mixture is very inflammable, so

must not come in contact with the fire. Place the tin in a moderate oven and let the wax melt gradually. Stir it constantly. When cold this forms a paste. Apply with a rag and have another piece to rub with. Use plenty of "elbow-grease."

(2) Follow the same directions, only, instead of beeswax, use up all your old candle-ends.

(3) 1-2 pt. boiled linseed oil.

1-2 pt. kerosene oil, or 1-4 pt. turpentine.

Mix, and apply with a flannel; rub dry with a second flannel. This will remove all scratches and white marks. An excellent recipe.

A Dark Floor and Furniture Stain.

1-4 oz. of permanganate (crystals) dissolved in 1 qt. of water.

Apply freely and quickly to the dry floor or furniture with a brush so as not to stain the hands. If not dark enough, put on a second coat. When dry, polish.

How to Clean Wall-Paper.

Dust walls. With a little flour and water, make a lump of soft dough, and rub the wall gently downwards, taking the length of the arm at each stroke. In this way go round the room. As the dough becomes dirty, cut the soiled part off. For second round, begin just above where the last one ended. Do not cross the paper. Most papers clean well and look bright, but not always. So try first in an obscure corner. Baker's bread two days old can be used in the same way.

Kalsoming Walls.

First fill every crack or crevice with plaster of paris or cement mixed with water and worked smooth with a knife. Press into the cracks and smooth over. Cover any rough places or dark spots in the same way.

1-4 lb. glue.

8 lbs. whitening.

Put the glue to soak in cold water overnight. In the morning heat and dissolve. Mix whitening with hot water and add the dissolved glue. Stir together, adding warm water,

until the consistency of thick cream. Skim milk can be used instead of water. Then omit glue. Any shade of "color" can be added.

To Make Permanent Whitewash.

Make whitewash in the usual way. Place on the fire and bring to the boil. Stir into each gallon—

1 tablespoonful of powdered alum.

1-2 pint of good flour paste.

1-2 lb. of glue (dissolved in water).

Boil all together. This wash nearly equals paint. This is used in many large houses instead of wall paper. Any color can be bought in powder form and added to the mixture, thus giving a variety of shades for decoration. The effect is attractive and sanitary.

Cleaning Carpets.

Nothing is safer or more serviceable than bran slightly moistened—only very slightly, just sufficient to hold the parts together. Sift the bran evenly over the floor. Then sweep in the usual way. All the dirt is gathered into the bran, and carpets swept in this way retain very little dust. This is demonstrated when they are taken up to be shaken.

Soot in Your Carpet.

If soot has fallen on your carpet, scatter salt over it. The soot adheres to the salt, and when brushed up lightly, the carpet is perfectly clean. The salt should be thoroughly brushed out.

How to Clean Oilcloth.

To ruin them, clean with hot water and soapsuds, and leave them half-wiped. They will soon crack and peel.

But if you wish to preserve them and have them look like new, wash with a soft flannel and lukewarm water and wipe perfectly dry. To make oilcloth look extra nice: After it is cleaned put a few spoonfuls of milk over it, and rub with a dry cloth.

Curtain and Portiere Poles.

The hangings will slip easily if rubbed with hard soap. This is

much better than greasing. If a thimble is put over a brass curtain rod, the rod goes through the casing without tearing the goods.

To Keep Frost off Windows.

Apply a thin coat of pure glycerine to both sides of the glass. In frosty weather clean your windows with alcohol.

To Remove Paint Spots from Windows.

Soften paint with alcohol and turpentine, equal parts, and polish with chalk.

Brass Paste—(Very Good).

2 tablespoons of flour.

1 tablespoon of mustard.

1 cup of salt.

1-2 cup of vinegar.

Enough water to make into a batter.

Heat vinegar and water. Stir into the dry ingredients, which have been mixed together beforehand. Use in the usual manner. If a hot polishing cloth is used it will increase the brightness of the brass.

Save Fat for Home-Made Soap.

During winter, ham, pork, bacon and other meats which yield a great deal of fat, are used more freely than in the warm weather. The careful housewife should see to it that not a scrap of the fat is thrown away or wasted, says the Newark News. To be sure, some of it may be used to advantage in making gravies and sauteing vegetables; but in almost every household there is a tendency to throw away the fat as quickly as possible. Instead of practising this extravagance, strain the fat and put it into a covered pail or can. When you have three or four pounds, make it up into soap.

Of course those who have never made soap look upon it as a bit of extra work that is not only difficult, but really time wasted; but the woman who has had the joy of using home-made soap knows differently. At best, it takes but a little while, the ingredients ready, to make pure white soap for laundry or toilet use. borax, stirring constantly until the

The fat should be free from impurities. A simple way of bringing about this result is to put the fat into a kettle with a little water; set on the stove or in the oven; the impurities will sink to the bottom of the kettle; the fat will come to the surface, and, when cold, may be taken out in a single cake. Weigh the fat carefully. Take this clarified fat, put it into a pail or kettle and set it where it will melt.

Into a good-sized crock or pan put a can of lye for every five pounds of fat. Add to this lye five quarts of water and two tablespoonfuls of borax, stirring constantly until the mixture stops boiling—the boiling is not put on the stove. When cool, stir in the fat slowly, and, when the mixture has begun to thicken, pour

into pans or pasteboard box covers. Mark off into squares before it hardens.

If soft soap for laundry purposes is desired, increase the quantity of water, using at least three times as much; keep this soap in a covered crock.

Home-made soap of this kind will make rich white suds; there need be no fear of using it when washing laces, blankets, or the daintiest of lingerie, for it will not harm the most delicate of fabrics.

If one wishes the soap for toilet purposes, it may be scented by adding a little violet, rose or other essence.

BIRTH STONES, ETC.

January—Garnet—Constancy.

February—Pearl or Amethyst—Purity, Peace.

March—Bloodstone—Courage.

April—Diamond—Unchanging Affection.

May—Emerald—Happiness in Love.

June—Agate—Long Life and Health.

July—Ruby—Exemption from Love Doubts.

August—Moonstone—Married Happiness.

September—Sapphire—Cheerfulness.

October—Opal—Hopefulness.

November—Topaz—Fidelity in Friendship.

December—Turquoise—Success, Many Friends.

Wedding Anniversaries.

One year—Paper wedding.

Five years—Wooden wedding.

Ten years—Tin wedding.

Fifteen years—Crystal wedding.

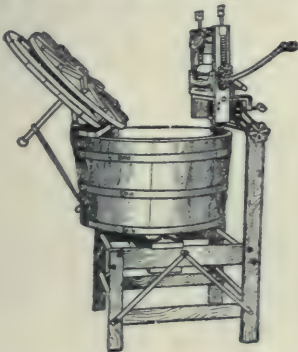
Twenty years—China wedding.

Twenty-five years—Silver Wedding.

Fifty years—Golden wedding.

Seventy-five years—Diamond wedding.

The Connor Ball-Bearing Washer



will wash your clothes to snowy whiteness in a remarkably short time.

Easy to work Will save your time, health and clothes.

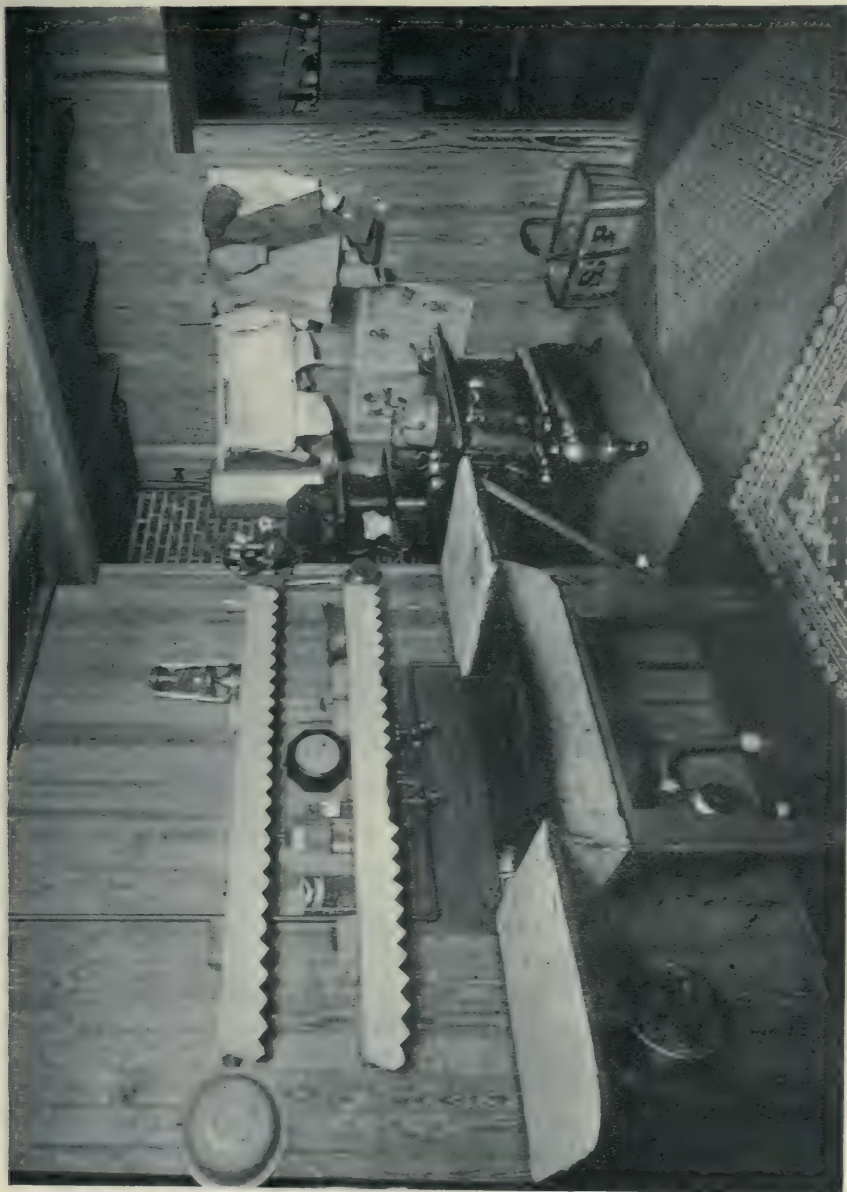
Do not be without one another wash day.

Write to

J. H. Connor & Son Ltd.
Ottawa, Ont.

RECIPES FOR REMOVING STAINS.

Character of Stain.	Re-Agents.	Method of Removing
Coffee, Tea or Chocolate.	Hot Boiling Water	Place bowl on table, spread stained part over it and pour water on it from a height so as to strike stain with force.
Fruit	Boiling Water	Spread stained portion over bowl, pour water from height of 18 inches or 2 feet. If the stain is fresh allow the stain to stand in milk. If the milk becomes too much discolored drain off and add more.
Ink	Milk, Salts of lemon, Javelle Water, If moist, Salt, Meal, Flour, Sugar, then wash in Cold Water.	If the stain is dry and will not come out as above, use salts of lemon or Javelle water, pour on, allow to stand a few minutes and wash thoroughly.
Mildew	Lemon or Sun	Rub lemon on and set in direct sunlight.
Iron Rust	Salts of lemon, Javelle Water	Rub with salts of lemon or Javelle water and wash.
Wagon Grease, Brass	Lard	Rub on stain, then wash.
Grass	Alcohol	Soak stains in Alcohol and rub out.
Paint	Vaseline and Benzine	Rub with same material if wet. If dry, soak and soften with vaseline. Rub with benzine.
Perspiration	Soap Solution and Sunshine	Place in sunshine in soap solution. Very hard to remove.
Machine Oil	Cold Water	Rub from outside to center, using care not to spread.
Wax	Absorbent Paper and Hot Iron	Place goods on absorbent paper and press with hot iron.
Blood	Soap and Warm Water or Cold	Wash in soap and warm water (not hot).
Scorch	Raw Starch	Rub on wet and allow to dry.
Wine	Sun	Expose to sun for a few hours.
	Salt, Boiling Water	Treat same as fruit stains.



The Working Corner of an Up-to-date Farm Kitchen. Note the inside water supply and sink.

Get your world through this telephone

Send for our **FREE BOOK**
"How to Build Rural Telephone Lines"

Our Free Book, "How to Build Rural Telephone Lines," tells how farmers all over Canada have built Telephone lines for themselves.

You can learn from this book all the information you require to enable you to organize a telephone company, and to

actually build a telephone line, if you wish. Send this coupon and get the book.

THE Northern Electric

AND MANUFACTURING CO. LIMITED

Makers of the Nation's Telephones

Montreal—Halifax—Toronto—Winnipeg—Regina—Calgary—
Edmonton—Vancouver—Victoria

FARM BUILDINGS AND EQUIPMENT

This chapter is a chapter of illustrations and is intended to convey ideas on modern equipment and conveniences. Pictures are more graphic in description than are words and far more interesting; therefore, the use of much reading matter has been avoided. The illustrations are fully explained throughout the chapter.



TWO FARM HOMES IN CANADA.

Built on Modern Lines and With City Conveniences.

EASY TO CLEAN AND KEEP CLEAN





Sunny, sanitary stables and clean, comfortable cows—that's the certain result of equipping your barn with BT Galvanized Steel Stalls.

No Manure Soaks Into BT Steel Stalls

BT Galvanized Steel Cow Stalls always look bright and clean in the stable, STEEL won't soak up manure, or rot. And there's no lodging place on the smooth, galvanized surface for filth, or dirt, or disease. No manure gets on the cattle-stand, and none on the bedding or on the flanks or udders of the cows, for a Patented Aligning Device on BT Steel Stalls lines every long and short cow evenly over the gutter, so all manure falls right into the gutter. Stable work is cut in two.

BT Galvanized Steel Cow Stalls STEEL STANCHIONS, PENS, WATERBOWLS

BT Galvanized Steel Stalls and other stable equipment soon pay back their cost by lessening stable expenses—there is less stable work, less disease, and fewer veterinary bills to pay.

And this sanitary, money-saving barn equipment is **EVERLASTING**. Made of 2-inch steel tubing, guaranteed to stand the heaviest strain. They are fireproof. Not affected by stable acids or moisture **BECAUSE THEY ARE GALVANIZED**. With cement floors and walls they make your stable practically indestructible.

Investigate all the facts about BT Equipment before you build or remodel your barn. Write for our illustrated Stall

Book, No. 21. You will be interested in the many fine photos of modern barns showing BT Steel Equipment in actual use. Also ask for valuable book, "How to Build a Dairy Barn," that shows how to frame your barn at half the cost of usual methods, and how to lay cement floors and walls, best measurements for cattle-stands, gutters, etc.

Barn Plan Service Free

State exact size of barn you propose to build or remodel, number of cows you will keep, and we will make you up-to-date plans giving handiest and most economical layout. Address

BEATTY BROS., Limited, 1242 HILL ST., FERGUS, ONT.

**BT Steel Stalls are the only
GALVANIZED Stalls in America**



**Cost no more than painted
stalls, look better, last longer**

Construction of Barns.

To go into any extensive discourse on different methods of construction in barns is not practicable in the limited space at the disposal of this chapter. Therefore, the illustrations of methods of construction as found in this chapter will explain themselves in lieu of lengthy articles on these subjects.

Stalls, Mangers, etc.

In this chapter will be found illustrations which will graphically indicate how cement stable floors should be made, and the depth and method of installing the fixtures for same. We give this information in relation to various widths of barns and with regard to feeding from the center or from the outside.

Hanging Litter Carrier.

Figures 205 and 206 show two methods of running a litter carrier through a doorway; the doorway being kept high so that the under side of the lintels or fan lights over the door will be on a level with the under side of the main beam.

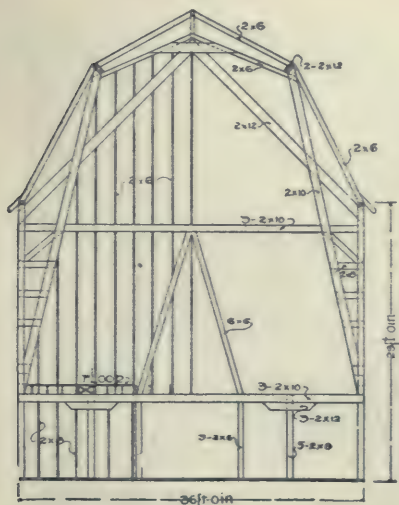
Modern Stables.

The accompanying plans are of modern dairy barns and modern stables, and each one of them has features especially to be recommended. Those who intend to build can

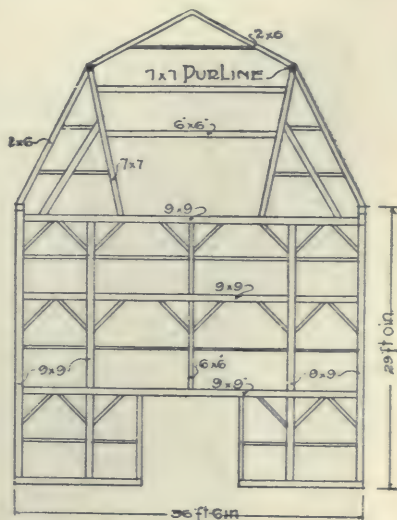
take these barns as a means of ascertaining just exactly what they need, as these plans lend themselves to modifications to meet the needs of the farmer.

Grouping Farm Buildings.

The barn will often contain the granary, sometimes the horse-stable, and perhaps, even the cow-stable. By this arrangement, there is saving in the original cost of the barn-yard buildings, with the further advantage, that the feed is always at hand. On larger farms, the same plan is in a measure followed. There may be separate buildings for each kind of domestic animal, for horses, for cattle, for sheep and for swine, but each of these should contain a supply of the necessary food. Some of the most complete barns have the stables for cattle in the basement, the horse-stables on the main floor, mills for grinding feed, cutters for hay and straw, pulping machines for roots and the silos connected with the barn by a covered passage. There should also be a steam engine, for driving the machinery and for pumping water, when this cannot be brought in pipes from higher ground. This is true economy, however many structures may be needed for surplus produce.



Showing Construction of Plank Frame Barn. End View.

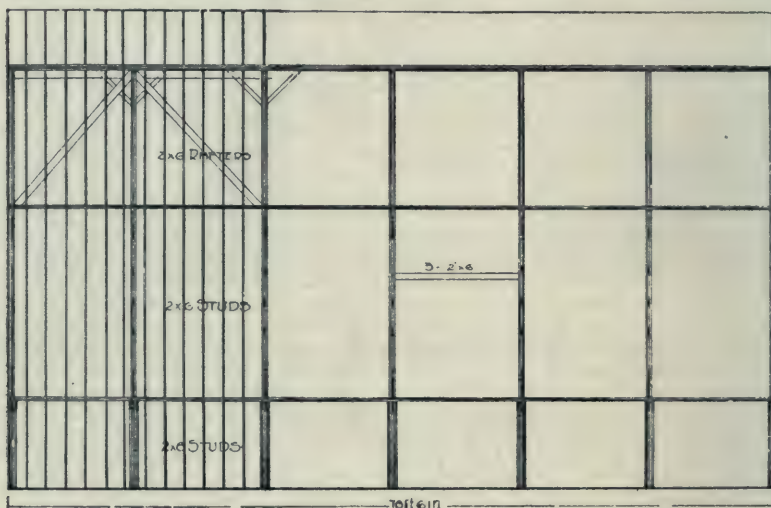


Showing Construction of Mortise Frame Barn. End View.

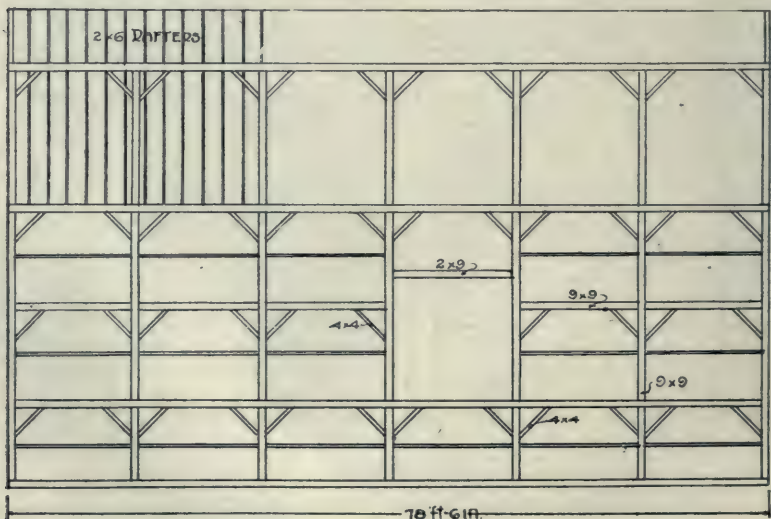
Sheep Barns and Their Arrangement.

It is well known that sheep will not bear close and constant confinement like cattle. They must have not only exercise, but plenty of air. Their natural habitat is in mountain regions, where the air is bracing. In the care of sheep this must always be kept in mind. Hence, sheep-barns must have an abundance of ventila-

tion, with large yards attached for exercise when the weather is favorable. In fact, their fleeces amply protect them from extreme cold when not exposed to storms. In all mild climates they thrive better under open, protected sheds. The mutton breeds, and especially the long-wooled breeds, and more especially the Leicester, require better protection than the hardy American Merino.



Showing Construction of Plank Frame Barn. Side View.



Showing Construction of Mortise Frame Barn. Side View.

Advantages of the Balloon Frame.

1. The whole labor of framing is dispensed with.

3. It is stronger and more durable than any other frame.

4. It is adapted to any style of building, and better adapted to all irregular forms.

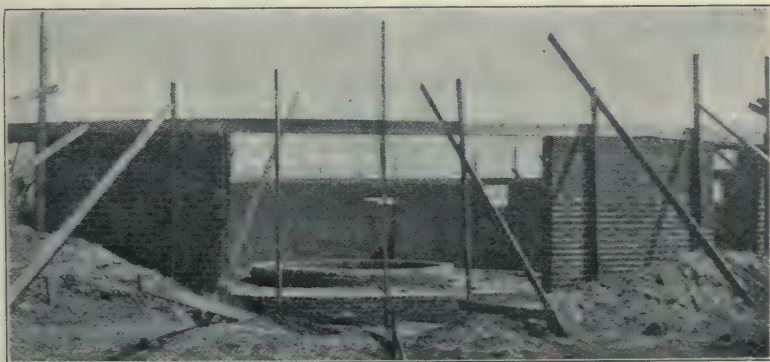
5. It is forty per cent. cheaper than any other style of frame.

6. It embraces strength, security, comfort and economy, and can be put up without the aid of a mechanic. The last two items are of especial value. The latter particularly so, where skilled labor is difficult to get.

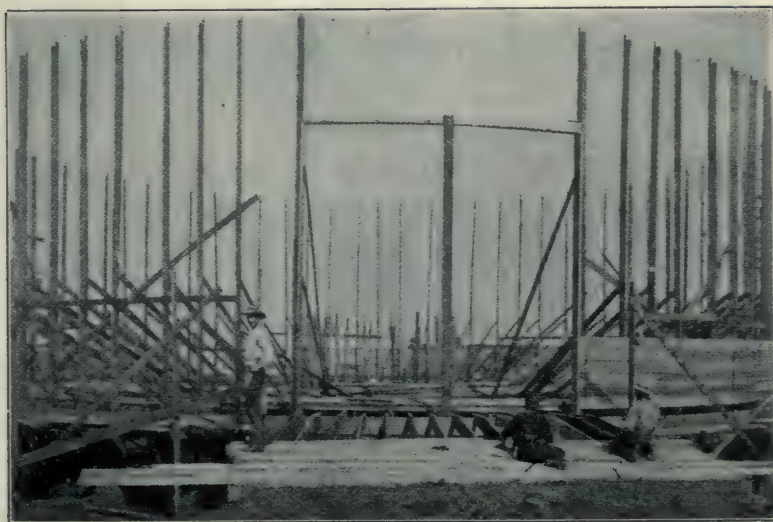
Mr. Woodward gives the following plain directions: "We hear and read much about the policy of cutting mortises, tenons, gains, etc., in the various pieces which go to make up the balloon frame. It is our opinion based upon a long and thoroughly practical experience, that he who does much of this, will have some mis-spent time to account for hereafter, besides weakening his building and hastening the decay of his frame.

Round Barn Most Convenient.

Considering that the barn on a dairy farm is used twice every day in the year, and that for six months



First Story Wall and Foundation for Silo, Feed Alley and Manger; Sill in Place, Ready for the Joists and Studs in Round Barn.



Showing Temporary Bracing to Hold Studs in Place While Ship Lap Ceiling is Nailed on. Round Barn.

each year the cows occupy it almost continually, and that during this time a large amount of the labor of the farm is done inside the barn, it is evident that the question of its convenience is a vital one. The amount of time and strength wasted in useless labor in poorly arranged buildings is appalling. People do not stop to consider the saving in a year or a lifetime by having the barn so conveniently arranged that there is a saving of only a few seconds on each task that has to be done two or three times every day.

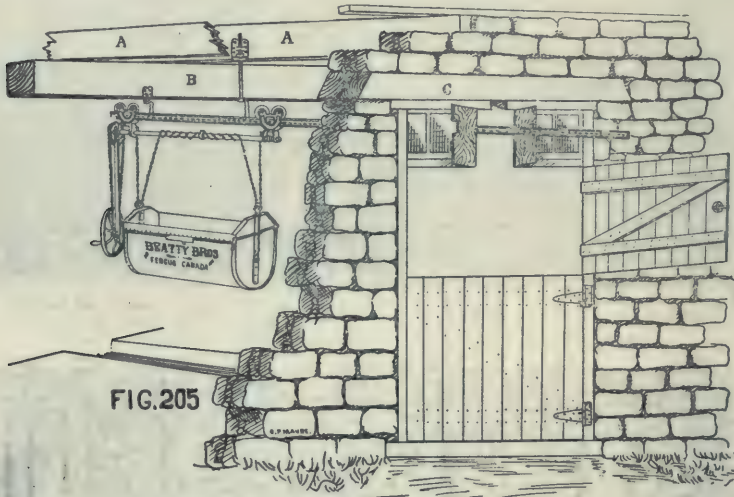
The round barn has a special advantage, in the work of distributing silage to the cows. The feeding commences at the chute where it is

point, thus in no case does the hay have to be moved but a few feet, which means a saving of much labor in the mowing.

To successfully embody all of the above discussed advantages in a dairy barn, is one of the large problems of milk production. In a careful study of the barn question it soon became apparent that it was impossible to embody all of the requirements advantageously in anything but a circular form of building, and the 60 foot round barn, which is here described, was built.

Circular Construction the Strongest.

The circular construction is the strongest, because it takes advantage



How to Run Litter Carrier Through Doorway.

thrown down, and is continued around the circle, ending with the silage cart at the chute again, ready for the next feeding. The same thing is true in feeding hay and grain.

Still another advantage is the large unobstructed hay mow. With the self-supporting roof, there are no timbers whatever obstructing the mow, which means no dragging of hay around posts or over girders. The hay carrier runs on a circular track around the mow, midway between the silo and the outside wall, and drops the hay at any desired

of the lineal, instead of the breaking strength of the lumber. Each row of boards running around the barn forms a hoop that holds the barn together. A barrel, properly hooped and headed, is almost indestructible, and much stronger than a box, altho the hoops are small. This strength is because the stress comes on the hoops in a lineal direction. Any piece of timber is many times stronger on a lineal pull than on a breaking stress. Take for example a No. 1 yellow pine, 2 x 6, 16 feet long, with an actual cross section of 1 5/8 x 5 1/2 inches. If placed on edge and sup-

ported at the ends, as a joist, the limit of safety for a load evenly distributed is 642 pounds, while the limit of safety for a load in the lineal direction of the same piece of lumber is 12,800 pounds, or twenty times as great.

All exposed surfaces of a round barn are circular, as both the sides and roof are arched, which is the strongest form of construction to resist wind pressure; besides, the wind, in striking it glances off and can get no direct hold on the walls or roof, as it can on the flat sides of gable ends of a rectangular structure. If the lumber is properly placed in a round barn, much of it will perform two or more functions. Every row of siding boards running around the building serves also as a brace, and the same is true of the roof boards and the arched rafters. If the siding is put on vertically and the roof built dome shaped, no scaffolding is required inside or out. These are points of economy in the round construction.

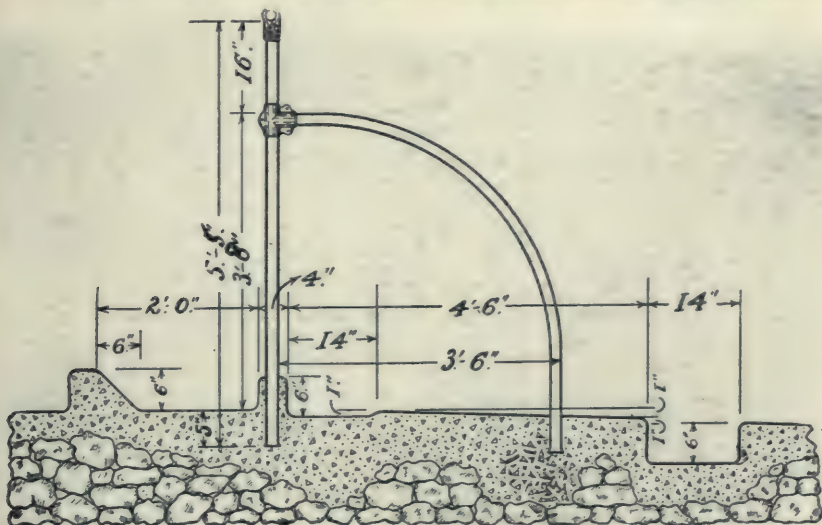
Rectangular Barns Require 34 to 58 Per Cent. More Material.

In order to compare the amount and cost of material in round and rectangular barns, the following figures have been carefully worked out

by an expert barn builder. Two comparisons, based on wood construction throughout, are made, in which round barns 60 feet and 90 feet in diameter are compared with both plant and mortise frame rectangular barns containing the same number of square feet of floor space, respectively. Since the most practical width of a rectangular dairy barn is 36 feet, its length will depend upon the number of square feet required in the barn.

Figures 6 to 9 are side and end views, showing the detail construction and size of the timbers of the plant frame and mortise frame barns here figured. The total number of feet of each kind of lumber required is given in Tables 1a and 1b. Since the proportion of the different kinds of lumber and shingles varied for the different barns, to draw an exact comparison it was necessary to base it upon the money value, and for this purpose the total cost of lumber has been figured in each case. The lumber values used throughout are the best average prices that could be obtained. As the same prices are used for the material of all of the barns, the comparisons of cost are correct, although these exact prices will not hold for all localities and all times.

Since a silo cannot be economically built inside of a rectangular barn, the



How to Put Up Steel Stalls in Stable. Note the Length of Stall, Drop and Feed Box.

first comparison is made with the barns simply enclosed, although one of the chief advantages of a round barn is the deep silo which it is possible to build so economically in the center.

Less Lumber.

Another item of economy in the

circular barn is less framing lumber. This form has the strongest possible construction with the least lumber in the frame, and the least bracing, not a single timber larger than a 2 x 6 being required above the sill. The arched circular roof requires no supports, and no scaffolding is needed inside during its construction. The



Yesterday—The Laborious Method of Cleaning Out the Stable.



To-day—The Use of the Litter Carrier Makes the Job easier and Quick.

Round and Rectangular Barns Compared.

In comparing the 60 foot round barn with a rectangular barn of the same area, the two barns should afford the cows the same amount of space on the platform. Allowing each cow in the 60 foot round barn 3 feet 6 inches in width at the rear of the platform, it will accommodate 40 cows and leave space for two passage ways. But in a rectangular barn, only 3 feet 4 inches of platform space need be allowed for each cow, and the 78½ foot barn, with two 3-foot passage ways across it for convenience in feeding, will accommodate 42 cows. While the rectangular barn has stall room for two more cows, the round barn contains space in the center for a silo 18 feet in diameter.

The floor space and cubical content of the round barn 60 feet in diameter, and the rectangular barn compared with it in these tables, are practically the same, and the barns are therefore directly comparable. This being true, the percentages which

were figured from the complete bills of material for these barns show the exact saving in lumber on the 60 foot round barn over the plank and mortise frame, rectangular barns 36 x 78½ feet. The lumber bills of the rectangular barns show an increase in cost of 28 per cent. for the plank frame and 54 per cent. for the mortise frame, rectangular barns 36 x in diameter, contains 188½, and the rectangular barn 225 lineal feet of wall. The rectangular barn has, therefore, 22 per cent. more lineal feet of outside barn wall, requiring a proportional increase in both paint and foundation.

The 176¼ foot rectangular barn would hold 100 cows, allowing each cow 3 feet 4 inches in width and providing for 3 passage ways of 3 feet each across the barn.

The 90 foot round barn would hold 100 cows in two rows headed together, 65 of which would be in the outer circle, and have 3 feet 6 inches each in width at the gutter. This leaves sufficient room for feed alleys and walks, and two passage ways, one 3 feet and the other 7 feet wide for



This New Husbandry Building at Guelph O.A.C. is roofed with Asbestoslate

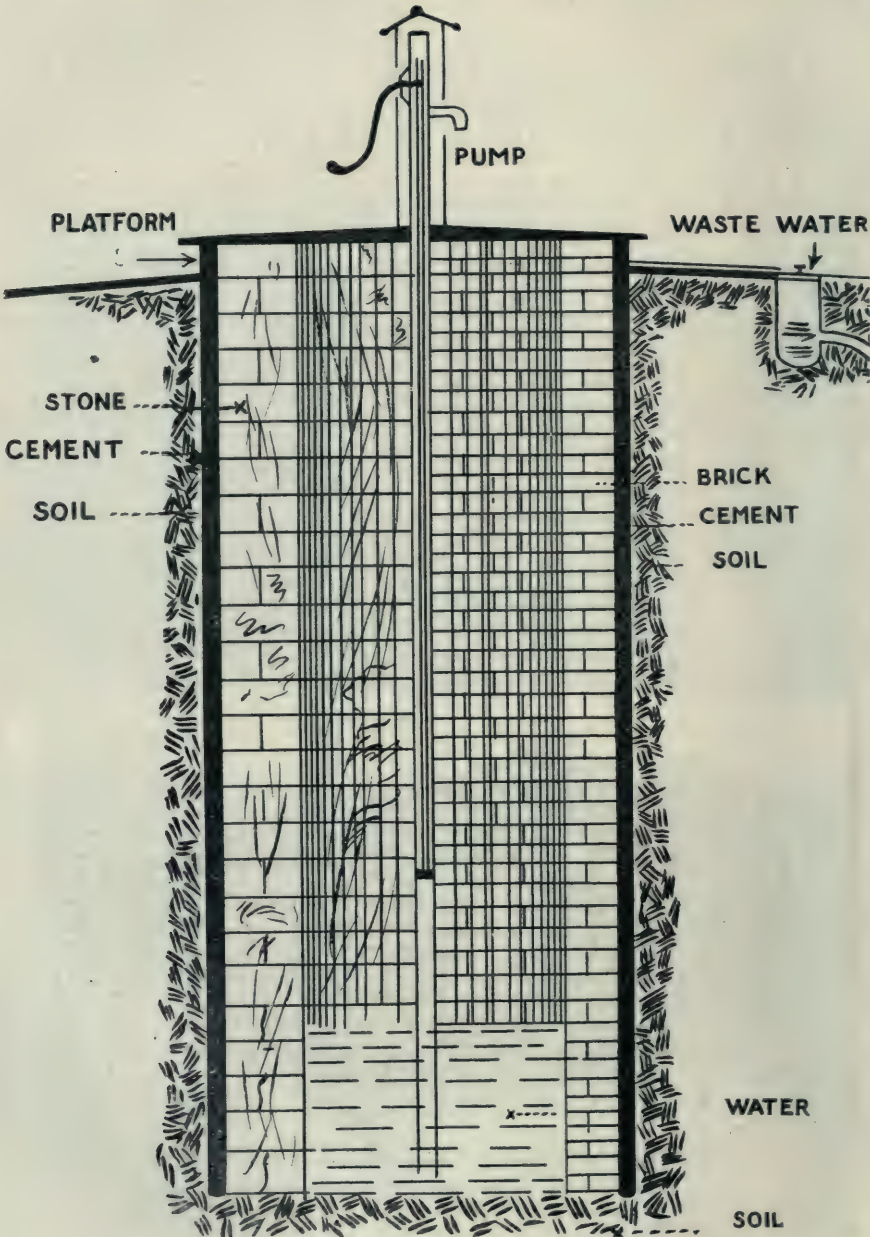
The Ontario Agricultural College is justly proud of this splendid building. It was erected according to the plans of the Provincial Architect at a cost of between \$65,000 and \$70,000—part of a Federal Grant for the promotion of Agriculture.

The selection of ASBESTOSLATE for the roof of such a building is another official recognition of the superiority of this fireproof handsome and practically indestructible roofing. Write for particulars, prices and booklet Y, to

Asbestos Manufacturing Company, Limited

Address E.T. Bank Bldg., 263 St. James St., Montreal

Factory at Lachine, P. Q. (near Montreal)



How a Disease and Seepage Proof Well is Constructed. Note the Run-off for Waste Water.

the manure and feed carriers. All of this is outside of a central space for a silo 20 feet in diameter and 71 feet high, with a capacity for 620 tons of silage, and in the mow there would still be an excess, above the capacity of the rectangular barn, of 33,000 cubic feet, which would hold 66 tons of hay, or as much as the entire mow of a barn 32 x 36 feet with 20 foot posts.

The square feet of floor space in the round barn 90 feet in diameter and rectangular barn 36 x 176 $\frac{3}{4}$ feet are the same, but the cubical content of the former is more than that of the latter. The increase in the lumber bill is 23 per cent. in the plank frame and 53 per cent. in the mortise frame barn. The round barn 90 feet in diameter contains 283 and the rectangular barn 426 lineal feet of wall. The rectangular barn has, therefore, 50 per cent. more lineal feet of outside barn wall, requiring a proportional increase in both paint and foundation.

The smaller surface on the outside wall of the round barn requires less paint and makes a proportional saving in keeping the round barn painted in after years.

Conclusions.

The advantages of the round barn are convenience, strength and cheapness.

The round barn is more convenient, because of the unobstructed mow, which reduces the labor required in mowing hay, and because of the greater care and fewer steps with which the feed can be gotten to the cows, owing to the central location of the supply.

The circular construction is the strongest because advantage is taken of the lineal strength of the lumber. All exposed surfaces are circular, and withstand greater wind pressure, as the wind can get no direct hold, as on the sides or gable ends of a rectangular barn.

In round numbers, rectangular barns require, according to their construction, from 34 to 58 per cent. more in cost of material than round barns with the same floor area and built of the same grade of material.



Method of Hanging Track in Barnyard so as to Distribute the Litter, etc.



THERE'S AN "IDEAL" BARN!

Yes, it's an ideal barn in many ways, as its owner at Baden, Ont., and hundreds of other farmers have found out. It is an

ACORN IDEAL BARN

built of a combination of steel and wood, cut, punched and assembled ready to set up. Here are a few of its many good features:—

Designed for Roominess.
Built Strong as Steel.
Great Grain Capacity.
Weather Proof—Decay Proof.
Fire Proof—Lightning Proof.
Neat Appearance and Clean.

It's economical in cost, too, because it will last a lifetime, and need neither paint nor repairs.

Let us send you our new catalogue. Coupon in back of book will bring it immediately.

Metal Shingle & Siding Co.

PRESTON,

ONTARIO

The Steel Frame Barn.

The steel truss barn is weather proof in every way.

It has a perfect system of ventilation.

It is equipped with the most modern and up to the minute door hangers, hay fork outfits and locks.

It is proof against fire from outside causes and proof against lightning.

It has more room inside than any

other form of barn construction—having no cross timbers the work of loading and unloading is very easy. The grains settle more quickly and there is more storage space.

No piece of lumber used in the construction is too large or heavy for one man to handle.

Ease and quickness of erection, taking few men.

All steel trusses being put together at our factory the framing of



A Canadian Highway Before Using Split-Log Drag.



Portion of Same Highway After Using Split-Log Drag.

the barn is a very easy matter for a few men.

After the size is decided upon there is no more work to do until the complete material is unloaded at the station, as these barns are supplies from foundation to peak by certain companies in Canada. If the farmer has lumber on the farm which he would like to work into this barn to save expense he can notify the firm of this fact, and the same will be deducted from the cost of the barn.

The barn being of metal construction, if properly erected, and the joints and bolts protected, will of course outlast the wooden barn.

Then again there is also a saving on insurance.

According to the manufacturers, the cost of a steel truss barn is no greater than the old wooden style, and from a practical standpoint it looks better, lasts longer, provides more room to a given area, and is fire and lightning proof to a far greater degree.

At any rate, the steel truss barn should be given a trial, and those who would like to get first hand information, can obtain it by writing to a few of the many farmers in Ontario and Western Canada who have erected them.

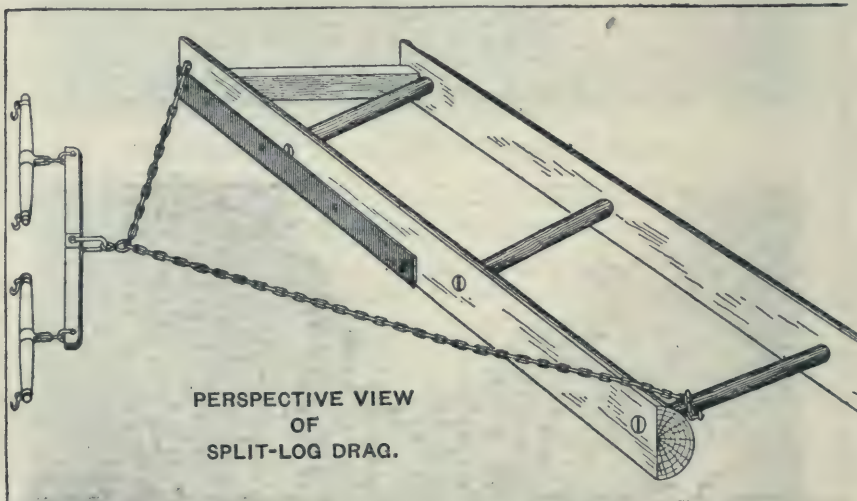
Mechanics as Applied to the Farm.

How to keep Farm Implements.

All farm implements should be kept under cover and cared for when not in use. The mowing machine, reaper, plows and all other implements having bright surfaces, should have these covered with a mixture of kerosene and lampblack, when put away. It is easily rubbed off when

they are wanted again, and the surfaces thus retain their polish. When left in the field over night they should be rubbed with an oiled cloth. Only pure oil, unsalted, should be used. A pint will last long and save many dollars.

You will be surprised, on trial, how small a space is really required to



Construction of Split-Log Drag.

store all tools, and small farm implements from the weather. An open shed will do for wagons, sleds, harrows, and that class of machinery; but a closed room is necessary for plows and other implements having bright surfaces. If they are exposed

under an unenclosed roof the moisture of the atmosphere is apt to rust them in damp weather, to say nothing of injury from dust and the danger that they will be stolen by night prowlers while the farmer is asleep.

In this day of improved imple-

ments successful farming cannot be carried on without perfect tools, and implements. They cost much money; with care they wear a long time; without care their life is short. The abuse of implements costs ten times their wear. A wise man looks to economy. Study the object lessons presented, and learn to economize by care. When first a tool is properly

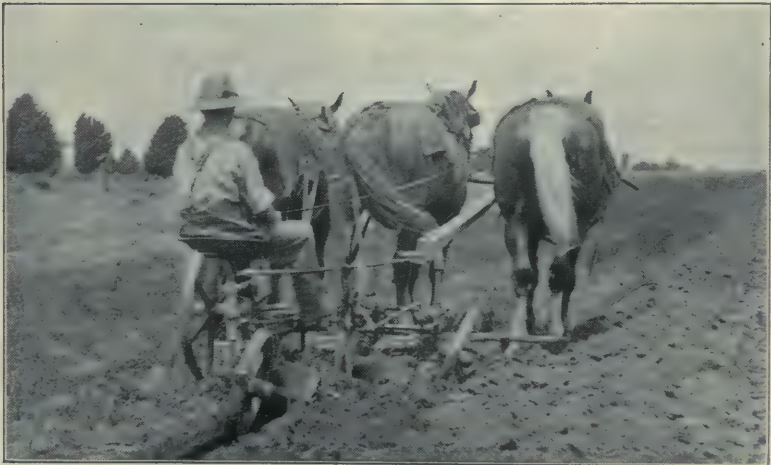
hung on the wall, as represented, outline its form with paint, or better still, paste up its name clearly written. It will save time in properly replacing them.

Shingling a Roof.

More persons fail in shingling a roof than in other rough building work, yet it is really very simple,



Rolling and Harrowing at the Same Time. The Four Horses Are Driven by One Man, Thus Saving Labor.



Utilizing the Time After a Rain Storm to Gang-plow the Land. Note Part of Grain Field Still in Stook.

ECONOMY ON THE FARM.

If you begin at the top of the roof to shingle, you will not be the first man who has done so. BUT DON'T! Always begin at the bottom. Break the joints by laying the center of a shingle over the cracks of two others, or a wide shingle to cover the cracks of narrow shingles. The rafters should be laid level; the shingles laid with not more than one-quarter of their length exposed to the weather, and nailed above the lap. Very wide shingles have three nails, the average two, and very narrow shingles one nail each.

Each line of shingles must be laid true to the line, one with the others, the lower course being laid about two inches over the edge of the lower-sheathing board. The details of shingling are as follows: Stretch a line at the proper distance beyond

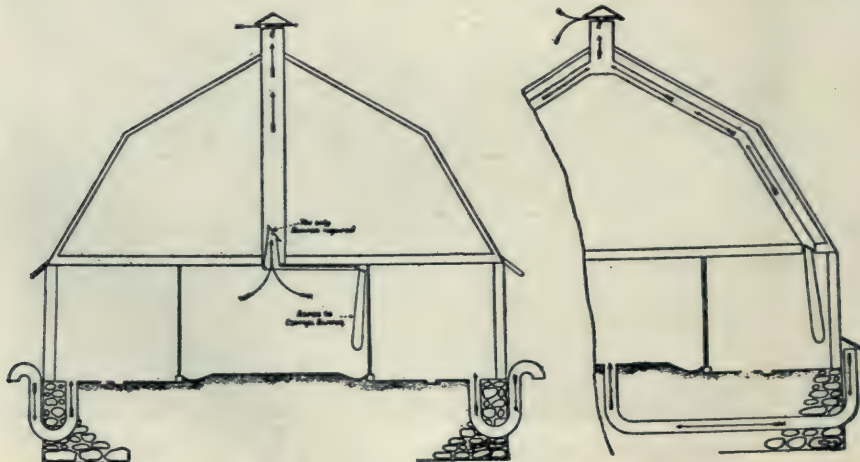
the lower roof-board, lay the butts of the first course of shingles to this line, narrow and wide, just as they come, discarding such as are shaky, wormy or rotten. This course laid, stretch the rechalked line along the row of shingles the proper number of inches above the lower edge, draw it tight, snap it, and you have the mark for the next course. Nail on this course, always having a shingle cover a crack by at least one inch. So proceed course by course, moving your foot-rest up the roof when you can no longer nail from the scaffold on the side. When you have reached the peak, saw the last shingles square with the slope of the other roof. Shingle the other side, saw these off fair, cover the peak with two strips, nicely jointed together, and the roof will be as good as the best.

VENTILATION.

For many years, the ventilation of stock barns was under careful experiment. Many recommended and suggested systems were put into operation in horse stables, cattle stables and hog pens, and the results were carefully compared. The object was to determine what system would produce the most uniform results in securing purity and dryness of atmosphere without draughts and with the least amount of attention. The results of these investigations have

been very profitable, inasmuch as a highly satisfactory system has been arrived at, and one that is not protected by patent rights. It is simple in principle and inexpensive to install. It is automatic in action and only slightly influenced by the rate or direction of the wind.

The system was invented and put into operation by Dr. J. G. Rutherford, for a number of years Dominion Veterinary Director General and Live Stock Commissioner, and is known as



Rutherford System, showing two ways it may be used.

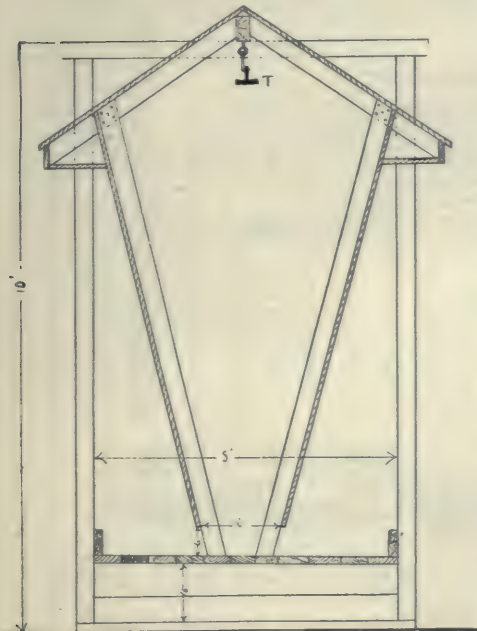
the "Rutherford" system. The principle upon which it works is that of an ordinary stove—the stable corresponding to the stove, the animals to the fire, the inlets to the front damper and the outlets for the foul air to the stove pipe or chimney. So long as the walls, windows and doors are fairly close, the animals raise the temperature and cause the ventilators to work, and this in proportion to the requirements. The greater the number of animals and the closer the stable, the more rapidly will the system operate. And this is what is needed, not only for purity of air, but for uniformity of temperature as well. In a close stable, the degree of foulness of atmosphere corresponds with the temperature, as both are directly influenced by the radiation and breath from the stock. The air warmed by the stock naturally rises and seeks an outlet. The outlet is necessarily at the ceiling and consists of a flue which passes through the roof. At the Experimental Farm, the flues pass through an upper story. These should extend well above the building for the same reason that a

chimney must do so in order to draw well.

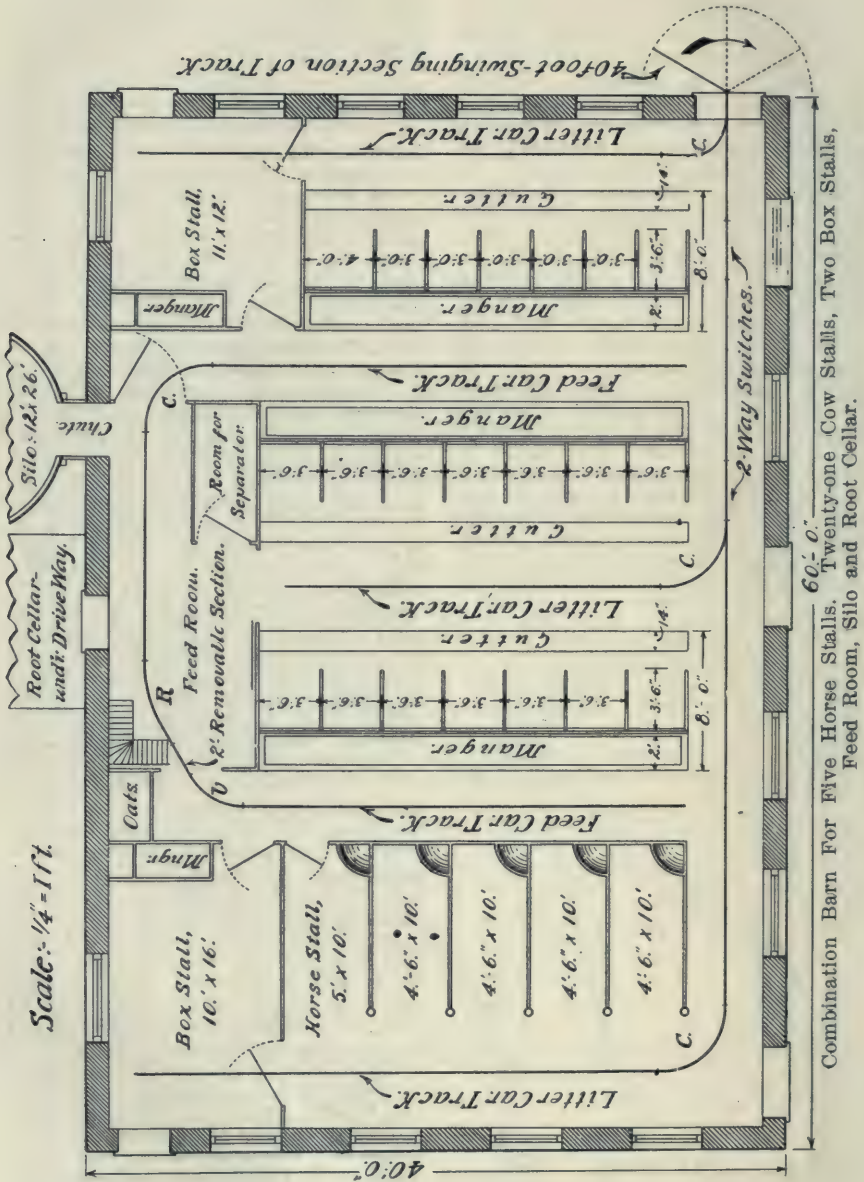
The inlets enter the stable at the floor level. The inlet pipe is U-shaped and passes beneath the foundation wall. If the fresh air is taken from a covered shed, the mouth outside may be near the ground level and be protected by a grating. If however, the air has to be drawn from outside, more especially in districts subject to snow fall, the pipe should extend 4 or 5 feet above ground and the opening should be roofed so as to avoid the entrance of snow or rain, or undue influence from the wind. The roofed pipe is built against the wall, and the air enters through slots in the sides close against the building. The size of these openings corresponds with the capacity of the pipe inside.

The ventilator works by virtue of the natural tendency of warm air to rise. As the air warms, it becomes foul, rises and escapes by the outlets. As nature abhors a vacuum, the escape of the warm air creates a suction of fresh air by way of the inlet pipes. Since the animals are constantly giving off warmth and expelling carbonic acid gas, the warm, foul air is constantly escaping and cold, fresh air is at the same time entering the stable, thus keeping up a gentle, almost imperceptible, system of ventilation. To regulate the ventilation, a damper is provided in the outlet flue. The closing of this also stops a large extent the inflow of fresh air, as the draught ceases, stopping the suction. By the original system, the inlet pipe enters at the floor level. This is to facilitate a steady, unobstructed, almost imperceptible flow of air through the stable towards the outlets. To guard against chaff, and dust falling into the opening, Mr. Grisdale, in the main cattle barn at the Farm raised the openings about four inches above the floor level.

The amount of ventilation necessary for a barn depends upon the number of animals to be housed. Sufficient is needed to maintain in cold weather a temperature of from 40 to 45 degrees Fahrenheit. A well-built stable, stocked to a reasonable capacity, should have the air changed every 30 to 45 minutes. Air removed at this rate will carry off the foul air as it is expelled from the stock;



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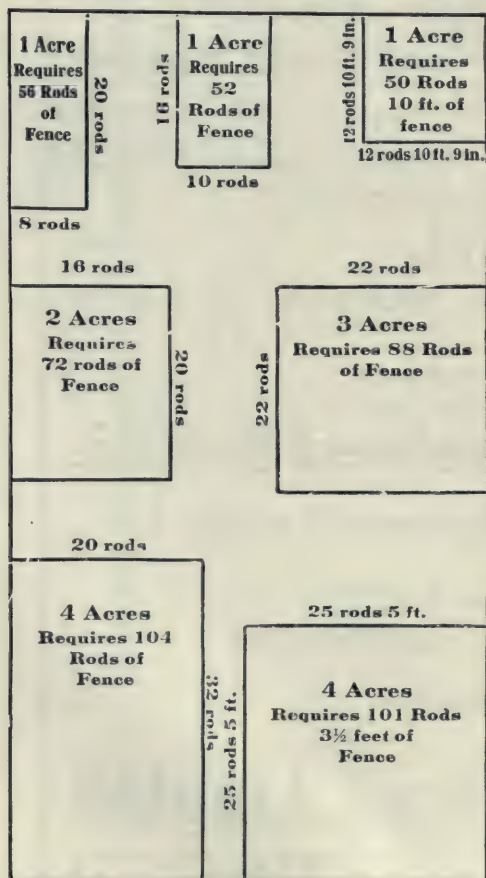
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it will also remove the vapour which, if allowed to remain, would condense on the walls and ceilings.

The intake and outlet flues should be about the same in capacity that is, provided the stable is tightly constructed. Because more or less air is sure to enter around windows and doors, the intakes may be slightly smaller than the outlets. At the Experimental Farm, this system is in operation in the main cattle barn in which the milking herds are housed, a bull barn, a barn for fattening cattle, a horse stable and the piggyery.

Dimensions of 1, 2, 3 and 4-Acre Lots and fence required to enclose them.



Dimensions given are exact, so that in buying fence, sufficient allowance should be made to cover fence taken up in wrapping around end and corner posts.

The main cattle barn 120 feet by 50 feet accommodates one hundred head. It has three outlets for foul air each 2 feet by 4 feet, and nine inlets for fresh air, each 3 feet by 10 inches. The fattening barn, 100 feet by 30 feet, which accommodates 50 head of steers, has two outlets, each 2 feet square, and three outlets each 3 feet by 20 inches. The bull barn, 100 feet by 30 feet, has three outlets about 3 feet square and three inlets about 3 feet by 20 inches. The bull barn outlets, although considered too large, are stated to work satisfactorily under average conditions. The horse barn which accommodates 25 horses, has two outlets, each about 2 feet square and three inlets each about 3 feet by 18 inches. In all these stables the ventilation is good under all conditions of weather.

The Fence on the Farm.

No matter how up to date the buildings and how well bred the cattle on the farm acres, there can be no satisfactory execution of the work unless the farm has good fences. The old snake fence, the old stake and rider fence, and the picturesque stone fence have no place in modern farming. The wire fence is the fence of the modern age and its classification should come under the head of Farm Buildings.

First class posts and the proper stretching of the wire fence are two prime factors in the building of such. The best fence that can be made will give poor service if not adequately stretched upon sound, rigid posts. It is a good thing to stretch fence until it appears to be tight and then stretch it again.

The illustrations accompanying this information will explain more than words can do the method of fence building.

Figure 1. Shows an end wood post properly anchored, and Figure 2, the correct method of bracing. Figure 3 shows wood and wire braces, and the other illustrations explain themselves.

As the anchoring of the end posts is very important the following information is in order: The anchors may be made of any solid pieces of wood, with a bearing equivalent of two inches by six inches by twenty-four inches long. The posts should



Post anchor for hollow places.

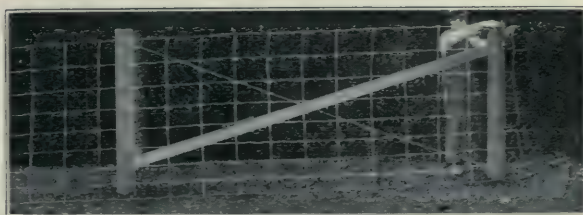
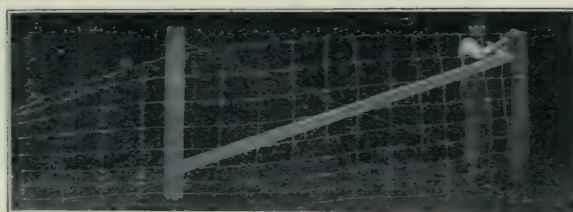


Fig. 7. Leaving Ends to wrap and staple.



Wrapping wire around own member.



Fig. 12. Stretcher in action.



Wood end post fitted with anchors.

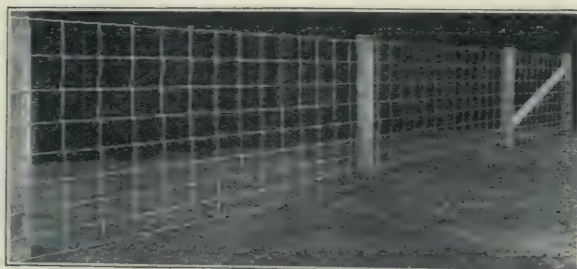


Fig. 15. The completed fence.

be placed so that the top anchor will bear against the ground in the direction the fence is to be pulled, as shown in Figure 2. Tamp every particle of earth in filling the holes, so that the posts will be as solid as a tree. The second or brace post, also anchored, should be set about eleven feet from the end post to permit the use of a wooden brace, four by four by twelve, or its equivalent, twelve feet long, placed diagonally to make sure the brace is stiff enough to stand the pressure without buckling. This brace should be set flat against the post, about ten inches from the ground at the second post, and the same distance from the top of the end post. On the second post flatten the post just enough to allow the

brace to have a solid bearing surface. Do not mortise so as to weaken the post, spike both ends of brace securely. The brace now having been set diagonally between the two posts, use No. 8 (or larger) soft galvanized wire for a counter brace, winding and stapling it around the bottom of the end post, close to the ground, and round the end of second post, about six inches from the top, using a wire stretcher to draw the wire as tight as possible. The rest of the work of building a fence is familiar to most farmers, except perhaps the method of posting in hollows. Posts in hollows should be anchored as shown in Figure 6, so that the fence shall not pull the posts out of the ground.



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CLOUDS AND WEATHER.

The following brief description will serve to identify the principle types of clouds and their general meaning in the forecasting of weather conditions.

Cirrus clouds are the filmy, fibrous, often thin clouds. They look like strands of hair or like horses' tails, or, as if a denser cloud had been drawn out into fibres by strong winds. After several days of hot weather this type of cloud is apt to be seen extending in long thin strands across the sky in a general east and west

direction. Under such conditions these clouds indicate approaching rain. After a storm, scattering strands of Cirrus clouds indicate fair weather.

Cumulus clouds are heaped up piles of white or gray masses. They have a level base and are apt to extend more widely some distance above the base. The edges are lobed. When clouds of this description increase rapidly at sunset, the indications are that rain will soon fall. When Cumulus clouds pile up in dark, ragged



TYPES OF CLOUDS.

Photographs furnished through the courtesy of Geographical Society, Chicago.

- | | |
|---|---------------------------------------|
| (1) Cumulus with cirrus in the back-ground. | (2) Cirrus and cirro-stratus. |
| (3) Cirro-cumulus cloud. Mackerel sky | (4) Large cumulus cloud near at hand. |
| (5) Cirrus streamers. | (6) Cumulus and nimbus. |

masses, some portions of which are silvery white, a thunder storm is indicated.

Stratus clouds lie near the earth. They are level, low and fairly dense. Especially in the summer these clouds are in evidence early in the morning. As the sun rises Stratus clouds change their height and shape and become Cumuli which readily disappear. If, instead of rising and dissipating, Stratus clouds grow more dense in the morning a storm is indicated.

Nimbus clouds are combinations of the three types named above. At the base is a dense layer of Stratus clouds. Rising above this are heaped up, sometimes ragged, Cumulus clouds, and at the top of all are flying strands of Cirrus clouds. This is the typical storm cloud which usually precedes a heavy downpour.

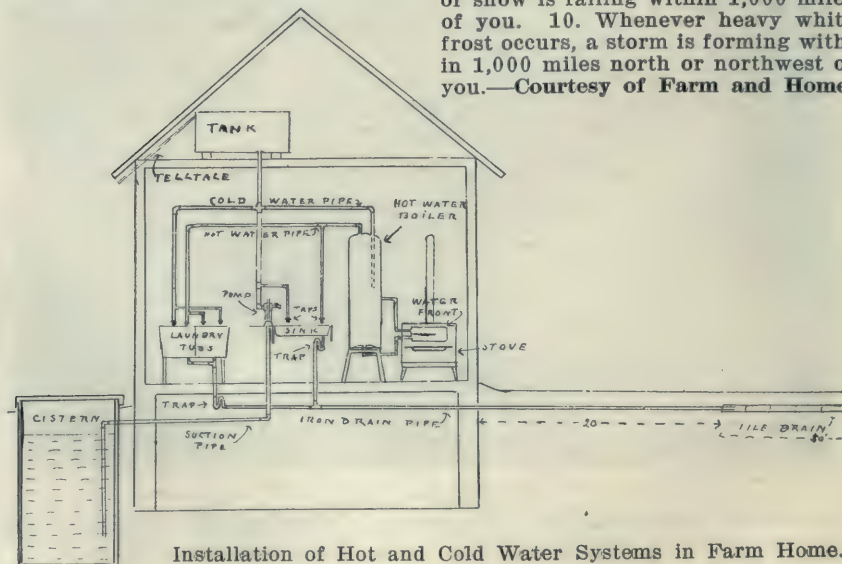
Cirro-cumulus are formed by the descent and massing of Cirrus clouds into small round balls, piled together. These clouds are apt to be seen in hot, dry weather or after storms in summer and under such conditions usually indicate further heat and drought.

Cirro-stratus clouds are everywhere familiar as the so-called Mackereel sky. They are a combination of the Cirrus type and the Stratus type, heavier than the former and more undulating or broken than the latter.

They are a fairly certain indication of approaching storm.

POPULAR WEATHER SIGNS.

The following formula of popular weather signs was adopted by the Farmers' Club of the American Institute a number of years ago: 1. When the temperature falls suddenly, there is a storm forming south of you. 2. When the temperature rises suddenly, there is a storm forming north of you. 3. The wind always blows from a region of fair weather toward a region where a storm is forming. 4. Cirrus clouds always move from a region where a storm is in progress toward a region of fair weather. 5. Cumulus clouds always move from a region where a storm is forming. 6. When Cirrus clouds are moving rapidly from the north or northeast there will be rain within twenty-four hours no matter how cold it is. 7. When Cirrus clouds are moving rapidly from the south or southeast there will be a cold hailstorm on the morrow if it be in the summer, and if it be in the winter there will be a snowstorm. 8. The wind always blows in a circle around a storm, and when it blows from the north the heaviest rain is east of you; if it blows from the south, the heaviest rain is west of you; if it blows from the east, the heaviest rain is south. 9. The wind never blows unless rain or snow is falling within 1,000 miles of you. 10. Whenever heavy white frost occurs, a storm is forming within 1,000 miles north or northwest of you.—Courtesy of Farm and Home.



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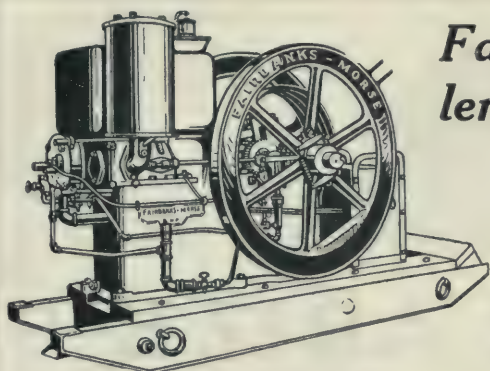
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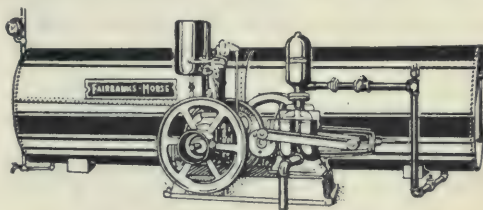
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Fairbanks-Morse Engines are the kind that are ready at all times. A recent visitor at our factory asked one of our operators if he would start an engine which was standing by. The operator with a single turn of the flywheel started it off without the least trouble. "There, that is just exactly what I hear of



Fairbanks-Morse Engines wherever I go," said our visitor. They are as reliable on the farm as on the test floor at our factory.

Don't waste the time and energy of yourselves or your wives carrying tons of water around in pails. Put in a water pressure system and have running water in your kitchen and barn.



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FARM POWER AND MACHINERY

Farm Motors.

The sources of energy which are used on the farm to drive machinery are:—(1) animal motors, (2) wind motors, (3) water motors, (4) steam motors, (5) oil motors, (6) gas motors, (7) electric motors.

All these motors are machines designed to utilize the energy of: (1) chemical action, (2) moving air, (3) running water, (4) and electricity.

The horse, the steam engine and the oil engine each derives its power from the chemical action of the fuel consumed or food eaten, and may therefore be called chemical engines; the windmill and the water wheel get their power by arresting the motion of wind or water, actuated by the force of gravity, and these may be called gravitation engines.

The Pull of a Horse.

It is estimated that a horse can pull with a force equal to one-tenth of its weight when it is working ten hours a day and is moving a load at the rate of 2 1-2 miles an hour. For example, a horse weighing 1,500 lbs. could pull with a force of 150 lbs. ten hours a day, moving a load at the rate of 2 1-2 miles an hour. For five or ten minutes a horse can exert a force equal to half its weight.

Experiments have been made to find the pull required to move a wagon on different roads. The total weight (load and wagon) was 2,000 lbs. The wagon was pulled at a walking pace, about 2 1-2 miles an hour. The pull was found by means of a self recording dynamometer. The wagon was used first with 6-inch tires and then with 1 1-2-inch tires. The average results were as follows:

Pull Required to Move 2000 Lbs. (Load and Wagon).

Kind of Road.	Pull, 6-in. Tires.	Pull, 1½-in. Tires.
Dirt	100 lbs.	125 lbs.
Gravel	84 lbs.	105 lbs.
Macadam	60 lbs.	75 lbs.
Sod	170 lbs.	255 lbs.
Plowed Ground	250 lbs.	375 lbs.

It will be noticed that with narrow tires the pull was greater in each case than with the wide tires. We learn from this table: (1) about how large a load can be reasonably asked a horse to haul, and keep it up all day; (2) that the better the road the larger the load a horse can haul; (3) that with wide tires on a wagon a horse can haul a greater load than when narrow tires are used. It can haul one-fourth more, on the average, on dirt, gravel and macadam roads, and half more, on the average, on sod and plowed ground.

Units.

Force is that which causes or tends to cause a change of motion in a body. This change may be in the velocity in the direction of motion. In Europe it is measured in kilograms, in this country usually in pounds.

Work is defined as "Force multiplied by the distance through which it acts." That is, if a weight of five pounds is lifted 3 feet, 15 foot-

pounds of work are done, no matter how long it takes. If a belt is pulling 100 pounds and running 1,000 feet per minute, it does 100,000 foot-pounds of work each minute.

Power is the rate at which work is done. It is the amount of work done each minute or each second. It is often expressed in "foot-pounds per minute," "horse-power," "watts," or "kilowatts."

Horse-Power.—In rating machinery, it is customary to express the power delivered or consumed in "horse-power." One horse-power requires that 33,000 foot-pounds of work be done each minute, or 550 foot-pounds per second.

Efficiency.—The efficiency of a machine is the ratio of the work which

it delivers to the work which is put on to it, or what is the same thing, the ratio of the power delivered to the power consumed.

Watts—Kilowatts.—In rating electrical machinery, the power is often expressed in watts or kilowatts (1000 watts). Seven hundred and forty-six watts equal one horse-power.

The Windmill.

It has been found by experience that it requires, on an average, a wind velocity of four or five miles an hour to drive a windmill, and that

the mill will run, on an average, eight hours a day. The average velocity of wind in Canada for eight hours per day is about 16 miles an hour.

Velocity of Wind and Pressure Exerted.

Velocity of the Wind Miles per hour	Feet per second	Pressure In lbs. per sq. ft.	Force of Winds.
1	1.47	.005	Hardly perceptible.
2	2.93	.020	Just perceptible.
3	4.40	.044	
4	5.87	.079	Gentle, pleasant wind.
5	7.33	.123	
10	14.67	.492	Pleasant, brisk gale.
15	22.00	1.107	
20	29.34	1.968	Very brisk.
25	36.67	3.075	
30	44.01	4.429	
35	51.34	6.027	High Wind.
40	58.68	7.873	
45	66.01	9.963	Very heavy storm.
50	73.35	12.300	
60	88.02	17.715	Great storm. A hurricane that
70			blows down trees, buildings,
80	117.36	31.490	etc.

Horse-Power of Windmill.

An 8-foot windmill in a 15-mile-an-hour wind will pump 2,450 imperial gallons of water a total height of 50 feet in 8 hours. With the formula as used for H.P., we find the horse-power of windmill and pump

in a wind of this velocity is .077 h.p., or about 1-13 h.p.

A 10-foot windmill in a 15-mile-an-hour wind can pump 3,000 imperial gallons to a total height of 85 feet in 8 hours. From the same formula this mill has .16, or about 1-6 h.p.

Water Power.

Water-power is not available on a majority of farms, and mechanical engines are fast taking the place formerly held by water-power appliances. Water motors are divided into three classes: (1) water wheels, (2) impulse wheels, and (3) turbines.

Water wheels have become out of date and very little used in Canada. The impulse wheel is so arranged that a stream of water from a nozzle

strikes the buckets. The turbine is designed to use a large quantity of water on low heads. It is used on heads from 3 to 150 feet and over. A turbine 2 feet in diameter on a 5-foot head produces 6 h.p. In doing this it uses 900 cubic feet of water per minute, and makes 200 revolutions per minute.

To find the H.P. of a stream, use the same calculation as used in other

horse-powers. Measure the fall in feet and the weight in pounds of the water which falls each minute. Multiply these together and divide by 33,000. The result is the H.P. of the

stream. For example, if 660 pounds of water per minute fall 100 feet, the H.P. of the stream is as follows: H.P. equal 660 by 100, divided by 33,000, equal to 2 H.P.

Results of Operations of Hydraulic Rams.

Strokes per Min.	No.	Fall. Feet.	Elevation. Feet.	Expend. Cu. Ft.	Water.		Useful Effect.
					Raised. Cu. Ft.		
66		10.06	26.3	1.71	.543		.9
50		9.93	38.6	1.93	.421		.85
36		6.05	38.6	1.43	.169		.75
31		5.06	38.6	1.29	.113		.67
15		3.22	38.6	1.98	.058		.35
10		7.97	38.6	1.58	.014		.18

Note.—Volume of air vessel = volume of delivery pipe. One-seventh of water may be raised to about 4 times head of fall, or one-fourteenth 8 times, or one-twenty-eighth 16 times.

Note.—For ordinary purposes from 2 to 25 gallons of water per minute are required to operate a ram.

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"BAKER" (Ball Bearing) WIND ENGINES

Galvanized Steel Towers, Suburban Outfits, Sub-structures, Flag Towers, Bell Towers.

PNEUMATIC WATER SUPPLY SYSTEMS

Hydraulic Regulators, Tank Valves and Floats, Hydrants.

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Cisterns, Tank Heaters, Feed Cookers, Automatic Water and

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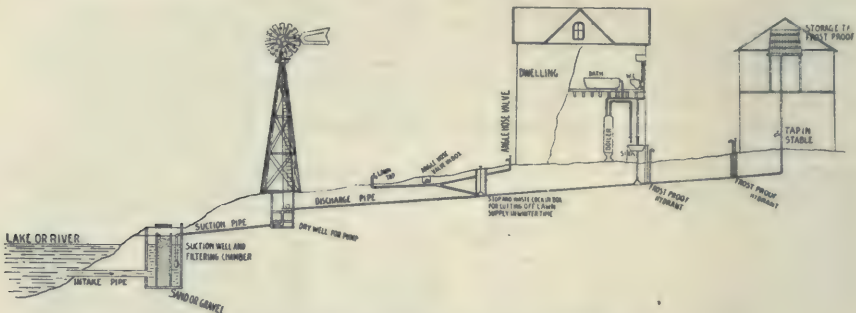
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Jobbers in Wrought Pipe, Well Supplies, Hose and Fittings

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A Model Pumping Airmotor Outfit—For Domestic Use

Showing Filtering Intake Chamber, Supply for House and Stable, and also Lawn and Garden Supply, the latter arranged so as to be shut off in winter and pipes emptied.

Water for Irrigating.

Units.

The "Acre-Foot" is the unit for measuring water used for irrigating land and is the amount of water which will cover one acre to a depth of one foot.

On this basis the unit is equivalent to covering two acres with six inches of water, or three acres with four inches, or twelve acres with one inch.

An "Acre-Inch" is one-twelfth of

an "Acre-Foot" or the quantity of water that will cover one acre to a depth of one inch. An "Acre-Foot" is equivalent to 43,560 cubic feet and an "Acre-Inch" to 3,630 cubic feet.

The flow of water is usually rated in cubic feet per second, so that one cubic foot per second will deliver two acre feet in twenty-four hours, which is equal to 450 gallons per minute.

Irrigating Data from Government Tests

Acres irrigated by different quantities of water, with allowance for evaporation; basis 28,320 gallons of water to irrigate one acre one inch deep.

Acres Irrigated in Ten Hours

Gallons Pumped Per Minute	1 Inch Deep	2 Inches Deep	3 Inches Deep	4 Inches Deep	5 Inches Deep	6 Inches Deep
600	13.2	6.6	4.4	3.3	2.6	2.2
824	18.2	9.1	6.0	4.5	3.6	3.0
944	20.8	10.4	6.9	5.2	4.1	3.4
988	21.8	10.9	7.2	5.4	4.3	3.6
1000	22.1	11.0	7.3	5.5	4.4	3.7
1200	26.5	13.2	8.8	6.6	5.3	4.4
1500	33.1	16.5	11.0	8.2	6.6	5.5
2000	44.2	22.1	14.7	11.0	8.8	7.3

Flow in Ditches and Flumes

Velocity in feet per second, and quantity in gallons per minute. For various sizes and slopes.

	Slope in Inches per 100 Feet	Cross Sec- tion in Feet	1' x 1/2'	1 1/2' x 3/4'	2' x 1'	3' x 1 1/2'	4' x 2'	5' x 2 1/2'	6' x 3'	7' x 3 1/2'	8' x 4'	9' x 4 1/2'
Ditches of Uniform Section Fairly Smooth	3/4 Inch	Velocity G. P. M.	0.46 97	0.64 322	0.82 735	1.1 2250	1.4 5100	1.6 9000	1.9 15375	2.1 23000	2.3 33000	2.5 45370
	1 1/2 Inches	Velocity G. P. M.	0.65 142	0.91 457	1.2 105	1.6 3225	2.0 7200	2.3 12900	2.7 21700	3.0 33000	3.3 47250	3.6 65250
	3 Inches	Velocity G. P. M.	0.93 210	1.3 650	1.6 1425	2.2 4400	2.8 10000	3.3 18600	3.8 30750	4.2 46125	4.7 69000	
	4 1/2 Inches	Velocity G. P. M.	1.1 247	1.6 810	2.0 1800	2.7 5475	3.4 12225	4.0 22500	4.6 37125			
Rough Lumber or Smooth Cement	3/4 Inch	Velocity G. P. M.	1.2 270	1.6 825	1.9 1725	2.6 5200	3.2 1147	3.7 52085	4.2 03375	4.6 05025	5.0 07200	5.4 0975001
	1 1/2 Inches	Velocity G. P. M.	1.7 382	2.2 1130	2.7 2430	3.7 7500	4.5 16200	5.2 29250	5.9 47625	6.5 71520	7.1 10200	7.7 0140250
	3 Inches	Velocity G. P. M.	2.4 540	3.1 1560	3.9 3510	5.2 10500	6.4 22950	7.4 41625				
	4 1/2 Inches	Velocity G. P. M.	2.3 650	3.8 1920	4.8 4312	6.4 12900	7.8 28050					
	6 Inches	Velocity G. P. M.	3.3 742	4.4 2220	5.5 4950	7.3 14775						
Flumes of Smooth Planed or F. & G. Lumber	3/4 Inch	Velocity G. P. M.	1.7 382	2.3 1162	2.7 2430	3.6 7275	4.4 15750	5.0 28125	5.6 45000	6.2 68250	6.8 97500	7.3 13750
	1 1/2 Inches	Velocity G. P. M.	2.4 540	3.2 1620	3.9 3510	5.1 10275	6.2 22350	7.1 39750	8.0 64500			
	3 Inches	Velocity G. P. M.	3.4 765	4.5 2250	5.5 4950	7.2 14550						
	4 1/2 Inches	Velocity G. P. M.	4.1 915	5.5 2775	6.7 6037							
	6 Inches	Velocity G. P. M.	4.8 1072	6.4 3225	7.7 6937							

Useful Information—Water

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases as the square of the velocity.

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches or a column of water 33.9 feet high at sea level.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434. Approximately, we say that every foot elevation is equal to one-half pound pressure per square inch; this allows for ordinary friction.

To find the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144 and divide the product by the area of the pipe in inches.

To find the area of a required pipe, the volume and velocity of water being given, multiply the number of cubic feet of water by 144 and divide the product by the velocity in feet per minute. The area being found, it is easy to get the diameter of pipe necessary.

Equivalents of Various Weights and Measures

	U.S. Gallon	Imp. Gallon	Cubic Feet	Cubic Inch	Ton	Pound	Liter	Cubic Meter
U. S. Gallon..	1.	.833	.133	231.	.00416	8.33	3.786	.00378
Imp. Gallon..	1.2	1.	.16	277.274	.005	10.	4.544	.00454
Cubic Foot...	7.48	6.23	1.	1728.	.0312	62.35	28.32	.0283
Cubic Inch...	.0043	.0036	.00058	1.	.000018	.036	.0164	.000016
Ton.....	240.	100.	32.08	55440.	1.	2000.	908.61	.9086
Pound.....	.12	.1	.016	27.72	.0005	1.	.454	.00045
Liter.....	.264	.22	.035	61.0165	.0011	2.2	1.	.001
Cubic Meter..	264.13	220.06	35.31	61016.	1.1	2200.	1000.	1.

One meter—39.37 inches—3.281 feet.

On inch—25.4 millimeters.

A common water pail, filled, contains 19 pounds of water or 2.272 U.S. gallons.

Steam Engine.

When steam engines were invented, the rate at which they could work was compared to that at which a horse could work. A "foot-pound" of work is defined as the work done when "a force of 1 lb. is exerted through a distance of 1 foot." An engine or horse is said to be working at the rate of 1 horse power when it does 33,000 foot-pounds of work in one minute.

To calculate the rate at which a 1,500-lb. horse works when it exerts a pull of 150 lbs. at the rate of 2 1-2 miles an hour:

There are 5,280 feet in a mile, and 60 minutes in an hour. Therefore, 2 1-2 miles an hour is 2 1-2 times 5,280, divided by 60, which equals 220 feet a minute. The horse exerts a force of 150 lbs. over a distance of 220 feet in one minute. Therefore, it does 150 times 220, or 33,000 foot-pounds of work in one minute, which equals 1 h.p.

If the horse were exerting a force equal to half its weight, 750 lbs., in going up hill, it would exert a force of 750 lbs. through 220 feet per minute. It would therefore do 750 times 220, or 165,000 foot-pounds, of work in one minute, which equals 5 h.p. This is one advantage a horse has over mechanical engines: A horse can work at five to ten times its ordinary rate for a short time, but the engine gains because it can keep it up an unlimited length of time at the same speed and force of exertion.

To Calculate the Horse-Power of an Engine.

This can be calculated by the rule: Horse-Power equals $P \times L \times A \times N$, divided by 33,000.

Where P equals the mean effective pressure in lbs. per square inch: L equals length in feet of piston stroke: A equals the area of piston in square inches: N equals the number of strokes per minute.

Example: An engine has a mean effective pressure of 30 lbs. per square inch; the length of the stroke is 1 foot; the area of the piston is 55 square inches, and the piston makes 240 power strokes per minute. The Horse-Power is:

$$\frac{30 \times 1 \times 55 \times 240}{33,000} = 12 \text{ H.P.}$$

Mean Effective Pressure.

The mean effective pressure of a steam engine is easily measured from indicator card, but an exact calculation otherwise is more complicated. It is the result of subtracting the mean or average back pressure on piston from mean forward pressure. The greater distance the piston travels before the steam is cut off, the greater will be the mean effective pressure. For instance, with an initial steam pressure of 80 lbs. per square inch and a cut off of 1-5, the mean effective pressure is about 31 lbs. With 1-3 cut off, it is about 47 lbs., and with 1-2 cut off, about 60 lbs., and with 3-4 cut off about 71 lbs. The average standard simple steam engine has a fixed cut off at a little over 1-2 the stroke.

The Gasoline Engine.

The greatest advantage of the gasoline engine on the farm is the fact that it does not require an expert or skilled mechanic to handle it, and it requires little attention

after being started. Few farmers to-day are able to do without this engine, it being considered the most useful piece of machinery on the farm.

The gasoline engine in common use on the farm is called a four-cycle engine. It is called this because the engine makes four strokes (two revolutions) for each power stroke. These four strokes are represented in the accompanying cut. They are called, respectively, the charging stroke, the compression stroke, the power stroke, and the exhaust stroke. Since there is only one power stroke in four strokes, a gasoline engine must be equipped with one or two fly-wheels. It is the momentum of the wheels that drives the engine between power strokes.

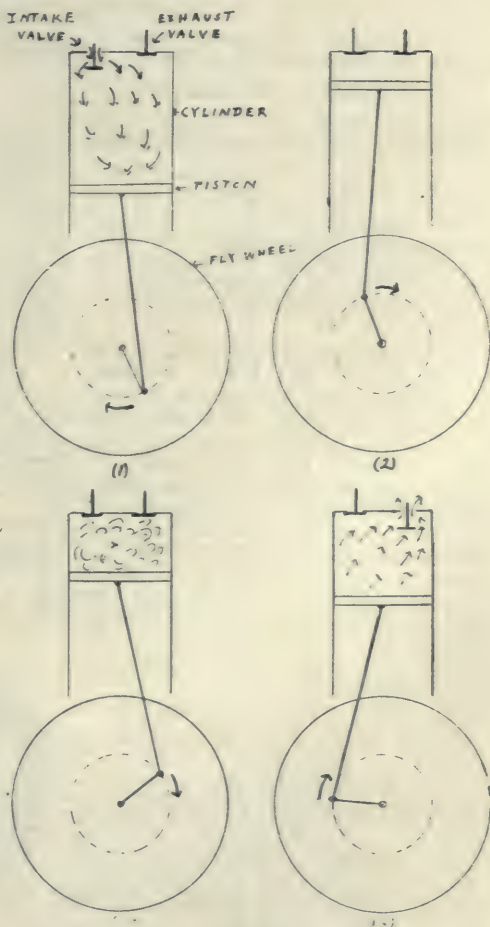
The Charging Stroke.—

In (1) the fly-wheel is pulling the piston down. This leaves a vacuum in the cylinder, and the pressure of the atmosphere forces open the intake valve. Air and gasoline vapor pass into the cylinder from the mixer (not shown). This stroke charges the cylinder with a mixture of gasoline vapor and air. It is called the charging stroke.

The Compression Stroke.—In (2) the fly-wheel is forcing the piston up. This compresses the mixture to about one-fifth its volume. This is called the compression stroke.

The Power Stroke.—When the piston reaches its highest point, an electric spark is produced in the mixture by a device not shown. This explodes the mixture. The force generated by the exploding mixture drives the piston down (see 3). This is the power stroke.

The Exhaust Stroke.—In (4) the



Working Strokes of Engine.

wheel is forcing the piston up again. While the piston is moving up, the exhaust valve is held open by an automatic device not shown in the figure. The burned gases are forced out through the exhaust valve. This is called the exhaust stroke. Therefore, there is only one power stroke in the four.

A gasoline engine uses 1 pint of gasoline per horse-power per hour

(the pint used here is U.S. measure, and is smaller than our Imperial pint).

Horse Power.

The horse-power of a gasoline engine is obtained by the same formula as is used to determine the horse-power of a steam engine, namely, horse-power equals $P \times L \times A \times N$, divided by 33,000, where P equals the mean effective pressure in lbs. per square inch, L equals length of stroke of the piston in feet, A equals area of piston in square inches, and N equals number of power strokes per minute. It must be remembered that the number of power strokes, N, is only one-fourth of the total number of strokes per minute.

The pressure in the cylinder varies greatly during the power strokes. When the explosion occurs it is very high, usually about 400 lbs. per square inch. It drops rapidly as the piston moves. The mean effective pressure is determined from indicator cards, and the horse-power calculated from this is called the indicated horse-power. It is a difficult matter to determine this mean effective pressure, and for this reason the horse-power is usually found by experiment by means of a prony brake on the fly-wheel. This gives the brake horse-power.

SCORE CARD FOR GASOLINE ENGINES.

Total Points 100.

Design and Economy of Operation 54 Points.

Simple contrivance for operation of valves	5 pts.
Working parts and gasketed joints easily accessible	7 "
Rated horse power equalling brake H.P.	14 "
Oiling system complete and easily accessible	9 "
Ample cooling surface	3 "
Ample space for safe storage of gasoline	2 "
Ample valve area	2 "
Standard type of Governor..	2 "
Standard type of Ignition System	5 "
Standard type of Carburetor.	5 "

Workmanship and Material 34 Points.

Close but easy fit of all parts	9 pts.
General finish and appearance	6 "
Bearings of brass, babbitt or well known composition made easily removable ...	9 "
Parts bearing strain of ample size and made of steel when necessary	10 "

Operation 12 points.

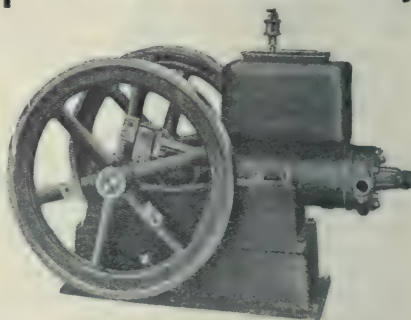
Ease of starting	5 pts.
Steadiness in running	4 "
Noiseless operation of valves	3 "

Total 100 pts.

Note.—This score card is intended for the use of the buyer of a gasoline engine. In comparing engines he may take the statements of the manufacturer and use the score card to prevent too much importance being laid on a minor point.

A certain amount of technical matter necessarily enters into this score card but questions on any points addressed to Canadian Farm will be answered through its columns.

Gilson "Goes Like Sixty" Engine The Engine of Quality



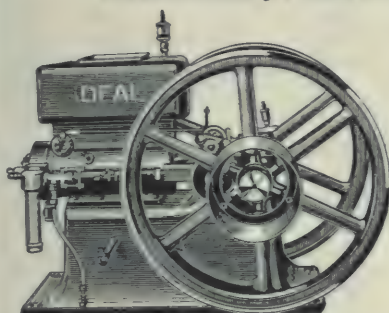
For all power purposes. Canadian product of highest class. Scientifically and mechanically correct—combining service, convenience, reliability and efficiency to an unequalled degree. Equipped with easy starting, speed changing, and spark retarding device. High tension, oscillating magneto, no batteries. Sold subject to trial and approval. Write for bulletins on engines, farm implements, pumps, etc.

GILSON MFG. CO., Limited,
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The Highest Grade Built
1-2 to 50 H.P.

Stationary, Mounted and Traction



We manufacture a full line of
Windmills, Grain Grinders,
Pumps, Tanks,
Water Boxes, Saw Frames,
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Power Sprayers

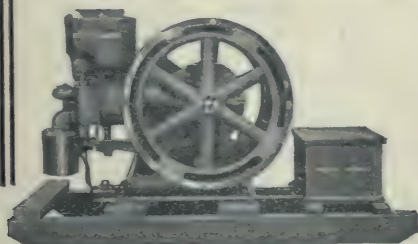
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Economical and Reliable Farm Power

Power from a Massey-Harris Engine is cheaper than man power—costs nothing in wages or keep when not working—and is “always on the job.”

Get one of these Engines, pump the water, saw the wood; run the cream separator, churn, washing machine, feed grinder, grindstone, ensilage cutter, pulper, etc.

Sizes, $1\frac{1}{2}$ to 20 H.P.—all described in our free catalogue.



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Branches at—Montreal, Moncton, Winnipeg,
Regina, Saskatoon, Yorkton, Calgary,
Edmonton, Swift Current.

Agencies Everywhere

Table of Horse-Power Costs

Motive Power	Rate of Fuel Consumption	Cost of Fuel per Brake Test Horse-Power				
	In pounds per H. P. Hour	1 Hour				
		Cost of Coal per 2,000 Pounds				
Gas Engine on Producer Gas		\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
	.8	.0012	.0016	.0020	.0024	.0028
	1.00	.0015	.0020	.0025	.0030	.0035
	1.25	.0019	.0025	.0031	.0037	.0044
	1.50	.0023	.0030	.0037	.0044	.0053

Gas Engine on Natural Gas	In Cubic Feet per H. P. Hour	Cost of Natural Gas 1,000 Cubic Feet				
		\$0.15	\$0.20	\$0.25	\$0.30	
	9	.0014	.0018	.0023	.0027	
	10	.0015	.0020	.0025	.0030	
	11	.0017	.0022	.0028	.0033	
	12	.0018	.0024	.0030	.0036	

Gas Engine on Illuminating Gas	In Cubic Feet per H. P. Hour	Cost of Gas per 1,000 Cubic Feet				
		\$0.60	\$0.70	\$0.80	\$0.90	\$1.00
	15	.0090	.0105	.0120	.0135	.0150
	17	.0102	.0119	.0136	.0153	.0170
	20	.0120	.0140	.0160	.0180	.0200

Gasoline Engine	In Pints per Brake H. P. Hour	Cost of Gasoline per Gallon				
		\$0.20	\$0.24	\$0.28	\$0.32	\$0.36
	.80	.0200	.0240	.0280	.0320	.0360
	1.00	.0250	.0300	.0350	.0400	.0450
	1.10	.0274	.0330	.0384	.0440	.0494

Kerosene Engine	In Pints per Brake H. P. Hour	Cost of Kerosene per Gallon				
		\$0.10	\$0.12	\$0.14	\$0.16	\$0.18
	1.00	.0125	.0150	.0175	.0200	.0225
	1.10	.0137	.0165	.0192	.0220	.0247
	1.20	.0150	.0180	.0210	.0240	.0270

Electric Motor 85% Efficiency of Wiring	In Kilowatts per H. P. Hour	Cost of Electricity per Kilowatt Hour				
		\$0.02	\$0.03	\$0.04	\$0.05	\$0.07
	0.878	.0175	.0263	.0351	.0439	.4106

Steam Engine on Coal	In Pounds per H. P. Hour	Cost of Coal per 2,000 Pounds				
		\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
	4	.0060	.0080	.0100	.0120	.0140
	6	.0090	.0120	.0150	.0180	.0210
	8	.0120	.0160	.0200	.0240	.0280
	10	.0150	.0200	.0250	.0300	.0350

Power Required to Run Various Farm Machinery.

Machinery	Power Required
Emery Wheels	From 2 to 5 h.p.
Feed and Ensilage Cutters	From 3 to 35 h.p.
Corn Shellers	From 3 to 6 h.p.
Feed Mills, not exceeding 12"	From 4½ to 12 h.p.
Small Portable Wood Sawing Outfits	From 3 to 10 h.p.
Pneumatic Water System	From 1½ to 3 h.p.
Cream Separators	Not over 1½ h.p.
Threshing Machinery	From 3 to 35 h.p.
Bean Threshers	From 4½ to 8 h.p.
Well Drilling	From 8 to 12 h.p.
Small Washing Machines	From 3 to 10 h.p.
Milking Machines	From 1 to 3 h.p.

Haypresses—

14 x 18 in. and 16 x 18 in.	8 h.p.
17 x 22 in. and 18 x 22 in.	12 h.p.

Pole Saws and Cord Wood Saws—

20 x 24 in. saw (20 to 40 cords in 10 hrs.)	3 h.p. speed 1600 rev. per min.
24 x 28 in. saw (30 to 50 cords in 10 hrs.)	4½ h.p. speed 1500 rev. per min.
26 to 30 in. saw (40 to 80 cords in 10 hrs.)	6 h.p. speed 1400 rev. per min.
28 to 32 in. saw (60 to 100 cords in 10 hrs.)	8 h.p. speed 1300 rev. per min.

Churns—

200- 300 lbs. churn	3 h.p.
300- 600 lbs. churn	4½ h.p.
600-1000 lbs. churn	6 h.p.

Corn Huskers—

2 roll with carrier and cutter head	4½ h.p.
2 roll with shredder or cutter head & blower	6 h.p.
10 roll with carrier	25 h.p.
12 roll with blower	45-50 h.p.

Note.—Number of roll huskers decides power required.

Concrete Mixers—

Batch mixers' (Mixer capacities are given in cubic yards per hour).

7 yd. mixer	3 to 6 h.p.
10 yd. mixer	4 to 10 h.p.
20 yd. mixer	6 to 12 h.p.
30 yd. mixer	8 to 15 h.p.
40 yd. mixer	10 to 20 h.p.

Continuous Mixers—

4-5 yd. mixer	3 h.p.
7 yd. mixer	5 h.p.
10 yd. mixer	6 h.p.
15 yd. mixer	9 h.p.
25 yd. mixer	12 h.p.

Note.—The power required for all machines varies greatly with the make: the manufacturers' catalogues usually give the power they recommend and one should be largely guided by these, remembering that the manufacturers place the power requirements as low as possible and that it is better to have a little too much than not enough power.

HORSE POWER REQUIRED TO PUMP 200 GALLONS OF WATER PER MINUTE TO VARIOUS HEIGHTS.

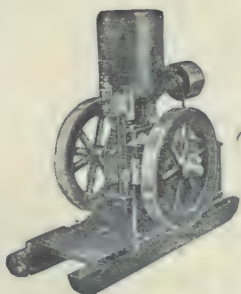
Gallons per minute	Height water is pumped	H.P. Required
200 gallons	20 feet	1 H.P.
200 gallons	40 feet	2 H.P.
200 gallons	60 feet	3 H.P.
200 gallons	80 feet	4 H.P.
200 gallons	100 feet	5 H.P.
200 gallons	150 feet	7½ H.P.
200 gallons	200 feet	10 H.P.

HORSE POWER REQUIRED AND SIZE PUMP REQUIRED TO PUMP VARIOUS NUMBERS OF GALLONS OF WATER PER HOUR TO HEIGHT OF 50 FEET.

Gallons per Hour	Height water is pumped	H.P. Required	Size Pump Required
240 gallons	50 feet	1-20	2½" x 6"
480 gallons	50 feet	1-10	3½" x 6"
600 gallons	50 feet	1-8	4" x 6"
900 gallons	50 feet	1-5	4½" x 7"
1200 gallons	50 feet	1-4	5" x 7½"
1500 gallons	50 feet	1-3	6" x 6½"
1800 gallons	50 feet	2-5	6" x 8"

H.P. given is theoretical. Multiply by 2 to get safe margin.

Satisfaction at Low Cost



is the explanation in a nutshell. All users of **"LONDON ENGINES"** say so. Who is a better judge than yourself, at your own work? Let one prove it to you. It is "your right" and "our pleasure."

All the advantages of both water-cooled and air-cooled.

Vertical non-freeze sizes, 1½, 2½, 3½ and 4½ h.p.

Horizontal single cylinder and double opposed, 10 to 50 h.p., and all kinds of outfits.

London Gas Power Co., Limited

LONDON, CANADA

Ask for Catalogue No. 32

Electric Motors.

When a steady flexible supply of and in cities and towns a transform- a 25 kilowatt portable motor was power is required nothing can be ing station is installed which receives hauled by four horses from farm to found more satisfactory than the this high voltage current and deliv- farm for demonstration purposes. electric motor provided electrical ers it for use at a voltage of 220 or The following table gives the results power can be purchased at a low misison have recently used a small and the comparison made by their rate. Electrical power is usually dis- transformer directly connected to engineers of the relative cost of tributed at a high voltage (22,000), their power lines. This together with steam and electricity for this work.

Hydro-Electric Demonstration Results
Threshing Wheat

Condition of grain	Time at place in days	Time running— time of delays deducted	Total in bush	Total kw-hr	Bush. per hour	Bush. per kw-hr.	Kw-hr. per bush.	Average demand in h.p.	Electric cost		Steam cost		Saving per bush. by using elec- tric drive.	Notes
									Tot.	per bu.	Tot.	per bu.		
Good...	3/4	4H-10M	265	87	62.2	3.04	.32	27.2	4.35	.016	6.77	2.56	.92	Straw not cut
Good...	1 1/4	5H-5M	476	92.5	93.3	5.15	.194	24.3	4.63	.0099	7.20	1.54	.55	Straw not cut

Threshing Oats

Fair but tough	1 3/4	11H-15M	1,179	165	104.8	7.14	.14	19.6	8.25	.007	12.84	1.09	.39	Straw not cut
Wet and tough	1 1/2	8H-20M	1,190	141	143	7.5	.103	22.2	7.05	.0059	10.97	.923	.333	Straw not cut
Fair...	1 1/2	7H-35M	1,450	198	191	7.8	.136	24.8	9.90	.00683	15.40	1.062	.377	Straw not cut
Fair...	2	6H-52M	1,140	203	162	5.36	.178	24.5	10.15	.0089	15.79	1.38	.49	Straw cut
Good but tough	2 3/4	13H-35M	2,180	325.5	165	6.69	.15	24.4	16.28	.0074	25.32	1.17	.43	Straw not cut

Hydro Electric Demonstration Results (Continued.)

SILO-FILLING

Size of Silo, Ft.	Capacity in cu. ft.	Amount cut and elevated—tons	Time at place—In hours	Time running Time of delays deducted	Total Kw-hr.	Tons per hour	Kw-hr. per ton	Pounds per Kw-Hr.	Average demand H.P.	Electric cost \$		Steam cost \$		Savings per ton using elec. drive	R.P.M.	Notes
										Tot.	Per ton	Tot.	Per ton			
14x40	6157.6	125	2	10H-15M	197	12.4	1.57	1268	25.5	9.85	07.86	15.32	.012	.442	944	Very green
16x45	9047.7	152½	2½	16H-14M	275	9.51	1.75	1109	22.	13.75	.09	21.40	.014	.499	1000	Fair weather
33x29	12917.5	270 (*)	2½	18H-35M	367	14.5	1.36	1471	24.5	18.35	.068	28.56	.0105	.378	944	Silo inside barn, trouble with belt.
x13½ oblig.		(†)														Rainy weather
15x40	7068.4	175	3½	20H- 3M	336	8.75	1.92	1041	22.4	16.80	.096	26.14	.149	.535	944	
16x40	8042.4	189	2	20H-15M	392	8.4	2.35	939	19.6	19.60	.103	30.50	.161	.578	944	
14x35	5388.	108	2	11H-05M	215	9.73	1.90	1004	25.9	10.75	.99	16.73	.15	.554	944	
14x40	6157.6	154	2	12H-45M	183	7.5	1.17	1683	21.5	9.15	.59	14.24	.925	.332	944	
16x37	7439.6	146	1	7H-15M	129	20.1	1.13	2262	23.7	6.45	.44	10.04	.68	.248	790	Rainy weather, Silo not filled
14x40	6157.6	154	2	11H-15M	136	12.7	1.13	2264	16.2	6.80	.44	10.60	.68	.248	790	Another Silo partly filled

Weight of ensilage taken at 30 to 50 lbs. per cu. ft. according to condition.

Silos all round except in the one case above referred to as oblong.

(*) Filled 32 ft.

(†) Filled 37½ ft.

Strength of Materials.

The tensile strength of materials is measured by the least weight in pounds which will break a vertical rod one inch square, firmly and squarely fixed at its upper end, the load hanging from the lower end.

Tensile Strength of Materials in lbs. per square inch.

Elm	6,000	Cast Iron	20,000
Hickory	11,000	Wrought Iron	57,000
Maple	10,000	Wrought Iron Wire rope..	38,000
Oak	10,000	Leather belts, good	3,000
Poplar	7,000	Manilla rope, best	12,000
White Pine	10,000	Hemp rope, best	15,000
Ordinary Steel	85,000	Cast Steel	114,000

If under compression instead of tension cast iron will crush under a weight of 105 lbs. to the square inch, cast steel 142, and the various woods at about 3-4 of the tensile strength given. The crushing strength of stone is about 4,300 lbs. per square inch.

Factor of Safety.

In actual practice we have to deal with the load that may be safely borne, and for this purpose the breaking load is divided by a factor of safety to secure the desired safe load. The following table gives the usual factors of safety.

Material.	Steady Stress. (Buildings)	Varying Stress. (Bridges)	Shocks. (Machines)
Timber	8	10	15
Stone	15	25	30
Cast Iron	6	15	20
Wrought Iron	4	6	10
Steel	5	7	15

Strength of Common Ropes.

The following table shows breaking weight and also safe weights which may be borne by ordinary ropes:

Rope	Breaking Weight Borne with safety	
One-eighth inch diameter	78 lbs.	31 lbs.
One-fourth inch diameter	314 lbs.	125 lbs.
One-half inch diameter	1,250 lbs.	500 lbs.
One inch diameter	5,000 lbs.	2,000 lbs.
One and one-fourth inch diameter	7,500 lbs.	3,000 lbs.
One and one-half inch diameter	12,500 lbs.	4,500 lbs.

Human Force.

The proportionate force between the hand of man on the tool used and the force exerted by the tool is given respectively in the first and second columns following:

	Hand	Tool
Draw knife	100 lbs.	100 lbs.
Large auger	100 lbs.	800 lbs.
Screw driver	84 lbs.	250 lbs.
Wrench, vise handle	72 lbs.	1,000 lbs.
Windlass, one hand	60 lbs.	180 to 700 lbs.
Hand saw	36 lbs.	36 lbs.
Brace and bit	16 lbs.	150 to 700 lbs.
Button screw, thumb and finger	14 lbs.	14 to 70 lbs.

Dimensions of Wrought Iron Gas Pipe.

In purchasing pipe, while one may suppose they are purchasing pipe at 1 inch diameter, that pipe is actually 1 and 3-64 inches in diameter. The table following gives sizes of pipe, both nominal and actual diameters, the actual outside diameter and the threads required per inch.

Pipe

Nominal. Diameter.	Actual Diameter	Actual. Outside. Diameter.	Threads. Per inch.
1-8	17-64	13-32	27
1-4	23-64	53-64	18
3-8	1-2	43-64	18
1-2	5-8	21-32	14
3-4	53-64	1 3-64	14
1	1 3-64	1 5-16	11 1-2
1 1-4	1 3-8	1 21-32	11 1-2
1 1-2	1 39-64	1 29-32	11 1-2
2	2 1-16	2 3-8	11 1-2
2 1-2	2 15-32	2 7-8	8
3	3 1-16	3 1-2	8
3 1-2	3 35-64	4	8
4	4 1-32	4 1-2	8
4 1-2	4 33-64	5	8
5	5 3-64	5 9-16	8
6	6 1-16	6 5-8	8
7	7 1-64	7 5-8	8
8	7 63-64	8 5-8	8

Table for the Conversion of Kilo-Watts to Horse-Power

1 K. W.—1.34 H. P. 1 H. P.—746 K. W.

K. W.	H. P.	K. W.	H. P.	K. W.	H. P.	K. W.	H. P.
15	20.10...	44	58.96	26	34.84.....	85	113.90
16	21.44.....	46	61.64	27	36.18.....	90	120.60
18	24.12.....	48	64.32	28	37.52.....	95	127.30
19	25.46.....	50	67.00	29	38.86.....	100	134.00
20	26.80.....	55	73.70	30	40.20.....	110	147.40
21	28.14.....	60	80.40	32	42.88.....	120	160.80
22	29.48.....	65	87.10	34	45.56.....	130	174.20
23	30.82.....	70	93.80	36	48.24.....	140	187.60
24	32.16.....	75	100.50	38	50.92.....	150	201.00
25	33.50.....	80	107.20	40	53.60.....	160	214.40

AGRICULTURAL STATISTICS

Dominion Government.

Field Crops of Canada, 1913.—The Census and Statistics Office of the Dominion Department of Trade and Commerce reported that the season of 1913 was very favorable for grain growing in the Northwest Provinces, where, during the ripening, harvesting and threshing periods conditions generally speaking were ideal. In Ontario, Quebec and parts of the Maritime Provinces, on the other hand, the yield of grain was adversely affected by prolonged drought.

For the whole of Canada the principal field crops occupied a total estimated area of 35,375,000 acres as compared with 35,575,000 acres in 1912, and their value, computed at average local market prices, was \$552,771,500, as compared with \$557,344,100 in 1912.

Wheat upon 11,015,000 acres produced 231,717,000 bushels of the value of \$156,462,000, the corresponding figures in 1912 being 10,996,700 acres, 224,159,000 bushels and \$139,090,000. Of the total wheat area, 970,000 acres were devoted to fall wheat, the production being 22,592,000 bushels and the value \$18,185,000, as compared with 971,000 acres, 20,387,000 bushels and \$17,157,000 in 1912. Oats yielded a total of 404,669,000 bushels from 10,434,000 acres, and the value reached \$128,893,000, the corresponding figures of 1912 being 9,966,000 acres, 391,629,000 bushels and \$126,304,000.

Both the spring wheat and oat crops of 1913 are the highest on record in Canada, spring wheat as regards area, yield and value and oats as regards area and yield.

The value of the oat crop was ex-

ceeded in 1911 when the amount was \$132,949,000. Barley upon 1,613,000 acres yielded 48,319,000 bushels of the value of \$20,144,000, as against 1,581,000 acres, 49,398,000 bushels and \$22,354,000 in 1912. Flax seed occupied 1,552,800 acres, and the production was 17,539,000 bushels of the value of \$17,084,000, as compared with 2,021,900 acres, 26,130,000 bushels and \$23,608,000 in 1912.

The quality of the grain crops, as indicated by the average weight per measured bushel, was excellent, and was superior to 1912. Spring wheat averaged 60.37 lb. against 58.90 lb. in 1912, oats 36.50 lb. against 35.50 lb. and barley 48.50 lb. against 47.50 lb.

In the three Northwest Provinces of Manitoba, Saskatchewan and Alberta the production in 1913 of wheat was estimated at 209,262,000 bushels, compared with 204,280,000 bushels in 1912, of oats at 242,413,000 bushels, compared with 242,321,000 bushels, and of barley at 31,060,000 bushels, compared with 31,600,000 bushels. The wheat production of 1913 in Manitoba was 53,331,000 bushels from 2,804,000 acres, in Saskatchewan 121,559,000 bushels from 5,720,000 acres, and in Alberta 34,372,000 bushels from 1,512,000 acres.

Field Crops of Canada, 1912 and 1913.—Table I. on pages 252-257 gives for 1913, compared with 1912, the area, yield and value of the principal field crops for Canada and for each of the nine Provinces. The figures are taken from the Dominion "Census and Statistics Monthly" of December, 1913, and are stated to have been carefully recalculated from data of the census of 1911.

I. AREA AND YIELD OF FIELD CROPS IN CANADA, 1912-1913

Crops	1912	1913	1912	1913	1912	1913
	acres	acres	bush.	bush.	bush. per acre	bush. per acre
Canada—						
Fall wheat.....	971,000	970,000	20,387,000	22,592,000	20.99	23.29
Spring wheat.....	10,025,700	10,045,000	203,772,000	209,125,000	20.32	20.81
All wheat.....	10,996,700	11,015,000	224,159,000	231,717,000	20.38	21.04
Oats.....	9,966,000	10,434,000	391,629,000	404,669,000	39.29	38.78
Barley.....	1,581,300	1,613,000	49,398,000	48,319,000	31.24	29.96
Rye.....	127,000	119,300	2,428,000	2,300,000	19.11	19.28
Peas.....	259,550	218,980	3,913,000	3,951,800	15.07	18.05
Beans.....	52,560	46,600	920,500	800,900	17.51	17.19
Buckwheat.....	398,700	380,700	10,517,000	8,372,000	26.38	21.99
Mixed grains.....	496,500	473,800	17,198,000	15,792,000	34.64	33.33
Flax.....	2,021,900	1,552,800	26,130,000	17,539,000	12.92	11.30
Corn for husking.....	298,190	278,140	16,949,700	16,772,600	56.84	60.30
Potatoes.....	484,000	473,500	84,885,000	78,544,000	175.38	165.88
Turnips, mangolds, etc.....	198,200	186,400	80,016,000	66,788,000	403.71	358.30
Hay and clover.....	8,276,000	8,169,000	12,117,000 tons	10,859,000 tons	1.46	1.33
Fodder corn.....	299,390	303,650	3,037,500	2,616,300	10.15	8.62
Sugar beets.....	18,900	17,000	201,000	148,000	10.63	8.71
Alfalfa.....	100,660	93,560	285,700	237,770	2.84	2.54
Prince Edward Island—			bush.	bush.	bush.	bush.
Spring wheat.....	32,000	32,000	582,000	628,000	18.39	19.62
Oats.....	180,000	180,000	7,358,000	6,143,000	40.77	34.13
Barley.....	5,000	4,000	145,000	111,000	32.04	27.73
Peas.....	90	80	2,000	1,600	22.33	20.25
Buckwheat.....	2,700	2,700	100,000	65,000	36.83	24.00
Mixed grains.....	7,700	7,800	355,000	308,000	45.83	39.50
Potatoes.....	33,000	32,000	6,741,000	6,219,000	206.39	194.33
Turnips, mangolds, etc.....	8,000	8,000	3,590,000 tons	4,024,000 tons	440.75	503.04
Hay and clover.....	194,000	190,000	248,000 tons	340,000 tons	1.28	1.79
Fodder corn.....	300	300	1,600	3,400	6.00	11.20
Alfalfa.....	90	90	220	270	2.63	3.00
Nova Scotia—			bush.	bush.	bush.	bush.
Spring wheat.....	13,000	13,000	265,000	267,000	20.19	20.50
Oats.....	100,000	101,500	3,267,000	3,291,000	32.53	32.42
Barley.....	5,000	5,000	143,000	134,000	27.22	26.89
Rye.....	300	300	5,000	8,000	16.40	27.00
Peas.....	200	200	5,000	6,700	25.50	33.25
Beans.....	900	900	24,000	22,000	26.95	24.93
Buckwheat.....	11,000	11,000	296,000	277,000	26.27	25.21
Mixed grains.....	4,000	4,000	150,000	143,000	34.70	35.65
Corn for husking.....	130	100	7,000	3,000	58.50	27.50
Potatoes.....	32,000	32,000	9,447,000	5,369,000	298.57	167.79
Turnips, mangolds, etc.....	12,000	12,000	5,606,000 tons	4,681,000 tons	475.54	390.06
Hay and clover.....	521,000	531,000	823,000 tons	876,000 tons	1.58	1.65
Fodder corn.....	600	600	5,300	4,000	8.58	6.32
Alfalfa.....	30	30	100	100	3.50	3.75
New Brunswick—			bush.	bush.	bush.	bush.
Spring wheat.....	13,000	13,000	236,000	269,000	18.11	20.72
Oats.....	195,000	195,000	5,607,000	5,946,000	28.81	30.49
Barley.....	2,700	2,500	74,000	74,000	27.42	29.64
Peas.....	600	500	10,000	11,000	16.14	21.30
Beans.....	300	300	6,500	4,300	19.25	14.33
Buckwheat.....	64,000	64,000	1,563,000	1,782,000	24.36	27.85
Mixed grains.....	1,000	1,000	28,000	30,000	27.36	30.30
Corn for husking.....	60	40	700	1,600	12.00	39.50
Potatoes.....	43,000	43,500	7,500,000	10,629,000	174.64	244.35
Turnips, mangolds, etc.....	10,000	9,000	2,721,000 tons	3,346,000 tons	284.75	371.73
Hay and clover.....	602,000	577,000	891,000 tons	698,000 tons	1.48	1.21

Fodder corn.....	190	150	1,400	1,700	7.30	11.00
Alfalfa.....	140	140	280	400	2.00	3.00
Quebec—			bush.	bush.	bush.	bush.
Spring wheat.....	60,000	58,000	974,000	1,054,000	16.17	18.17
Oats.....	1,296,000	1,303,000	33,516,000	39,025,000	25.86	29.95
Barley.....	94,000	89,000	2,226,000	2,263,000	23.69	25.43
Rye.....	11,000	10,000	173,000	156,000	15.44	15.60
Peas.....	30,000	26,000	449,000	451,000	15.11	17.34
Beans.....	5,000	5,000	84,000	97,000	15.59	19.35
Buckwheat.....	117,000	110,000	3,094,000	2,560,000	26.44	23.27
Mixed grains.....	104,000	101,000	2,783,000	2,867,000	26.74	28.39
Flax.....	900	800	9,000	9,000	9.66	10.84
Corn for husking.....	19,000	18,000	476,000	586,000	24.47	32.58
Potatoes.....	116,000	116,000	15,945,000	20,504,000	137.11	176.76
Turnips, mangolds, etc.	12,000	11,000	3,056,000	3,284,000	251.60	298.56
			tons	tons	tons	tons
Hay and clover.....	3,108,000	3,014,000	3,792,000	4,069,000	1.22	1.35
Fodder corn.....	34,000	34,000	1,254,000	255,000	7.38	7.50
Alfalfa.....	3,500	3,000	9,700	6,300	2.75	2.11
Ontario—			bush.	bush.	bush.	bush.
Fall wheat.....	735,000	739,000	15,163,000	17,669,000	20.63	23.91
Spring wheat.....	120,000	111,000	2,258,000	2,182,000	18.77	19.66
All wheat.....	855,000	850,000	17,421,000	19,851,000	20.38	23.35
Oats.....	2,785,000	2,814,000	97,053,000	105,159,000	34.85	37.37
Barley.....	512,000	485,000	15,093,000	14,589,000	29.49	30.08
Rye.....	93,000	85,000	1,711,000	1,567,000	18.38	18.43
Peas.....	226,000	190,000	3,374,000	3,431,000	14.95	18.06
Beans.....	46,000	40,000	801,000	670,000	17.57	16.74
Buckwheat.....	204,000	193,000	5,464,000	3,688,000	26.74	19.11
Mixed grains.....	371,000	352,000	13,556,000	12,098,000	36.54	34.37
Flax.....	9,000	7,000	143,000	164,000	16.70	23.38
Corn for husking.....	279,000	260,000	16,466,000	16,182,000	59.06	62.24
Potatoes.....	158,000	152,000	22,690,000	18,105,000	143.90	119.11
Turnips, mangolds, etc.	130,000	121,000	56,795,000	43,916,000	436.25	362.94
			tons	tons	tons	tons
Hay and clover.....	3,337,000	3,312,000	5,406,000	3,941,000	1.62	1.19
Fodder corn.....	251,000	255,000	2,685,000	2,247,000	10.70	8.81
Sugar beets.....	17,000	15,000	188,000	138,000	11.16	9.23
Alfalfa.....	76,000	69,000	211,000	160,000	2.76	2.32
Manitoba—			bush.	bush.	bush.	bush.
Fall wheat.....	15,000	19,000	333,000	388,000	22.22	20.44
Spring wheat.....	2,824,000	2,785,000	62,684,000	52,943,000	22.20	19.01
All wheat.....	2,839,000	2,804,000	63,017,000	53,331,000	22.20	19.02
Oats.....	1,348,000	1,398,000	57,154,000	56,759,000	42.40	40.60
Barley.....	481,000	496,000	15,826,000	14,305,000	32.92	28.84
Rye.....	5,000	5,000	105,000	103,000	21.00	20.64
Peas.....	400	.....	10,000	.....	25.00	.....
Mixed grains.....	1,500	1,500	68,000	41,000	45.00	27.17
Flax.....	100,000	54,000	1,252,000	632,000	12.49	11.70
Potatoes.....	27,000	26,000	6,182,000	5,120,000	231.55	196.93
Turnips, mangolds, etc.	4,000	4,000	1,451,000	1,011,000	354.20	252.80
			tons	tons	tons	tons
Hay and clover.....	151,000	162,000	259,000	240,000	1.71	1.48
Fodder corn.....	11,000	11,000	84,000	89,000	7.68	8.09
Alfalfa.....	3,500	4,000	9,400	11,000	2.73	2.82
Saskatchewan—			bush.	bush.	bush.	bush.
Fall wheat.....	3,000	4,000	65,000	94,000	21.56	23.57
Spring wheat.....	5,579,000	5,716,000	106,895,000	121,465,000	19.16	21.25
All wheat.....	5,582,000	5,720,000	106,960,000	121,559,000	19.16	21.35
Oats.....	2,556,000	2,755,000	117,537,000	114,112,000	45.99	41.42
Barley.....	292,000	332,000	9,595,000	10,421,000	32.87	31.39
Rye.....	2,700	3,000	57,000	68,000	21.00	22.67
Peas.....	400	400	11,000	7,000	28.00	17.50

Mixed grains.....	2,000	2,000	73,000	77,000	36.40	38.40
Flax.....	1,780,000	1,386,000	23,033,000	15,579,000	12.94	11.24
Potatoes.....	31,000	31,000	6,552,000	5,138,000	209.70	165.74
Turnips, mangolds, etc.	14,000	13,000	4,165,000	3,305,000	304.47	254.24
			tons	tons	tons	tons
Hay and clover.....	53,000	62,000	90,000	114,000	1.70	1.84
Fodder corn.....	1,300	1,600	2,000	11,000	1.50	7.00
Alfalfa.....	1,400	1,600	3,000	3,700	2.19	2.27
Alberta—			bush.	bush.	bush.	bush.
Fall wheat.....	212,000	202,000	4,628,000	4,242,000	21.83	21.00
Spring wheat.....	1,378,000	1,310,000	29,675,000	30,130,000	21.54	23.00
All wheat.....	1,590,000	1,512,000	34,303,000	34,372,000	21.57	22.73
Oats.....	1,461,000	1,639,000	67,630,000	71,542,000	46.30	43.65
Barley.....	187,000	197,000	6,179,000	6,334,000	33.05	32.15
Rye.....	15,000	16,000	377,000	398,000	25.56	24.89
Peas.....	460	500	9,000	8,500	18.50	17.00
Mixed grains.....	2,800	2,000	97,000	73,000	34.50	36.67
Flax.....	132,000	105,000	1,693,000	1,155,000	12.83	11.00
Potatoes.....	27,000	26,000	5,775,000	4,350,000	211.64	167.32
Turnips, mangolds, etc.	5,000	5,000	1,281,000	1,234,000	260.98	246.77
			tons	tons	tons	tons
Hay and clover.....	171,000	176,000	291,000	275,000	1.70	1.56
Fodder corn.....	600	600	1,200	2,200	2.00	3.70
Sugar beets.....	1,900	2,000	13,000	10,000	7.00	5.00
Alfalfa.....	9,300	9,000	24,000	25,000	2.56	2.77
British Columbia—			bush.	bush.	bush.	bush.
Fall wheat.....	6,000	6,000	198,000	199,000	33.00	33.14
Spring wheat.....	6,700	7,000	203,000	187,000	30.33	26.67
All wheat.....	12,700	13,000	401,000	386,000	31.57	29.69
Oats.....	45,000	48,500	2,507,000	2,692,000	56.00	55.50
Barley.....	2,600	2,500	117,000	88,000	45.33	35.25
Peas.....	1,400	1,300	43,000	35,000	30.66	26.67
Beans.....	360	400	5,000	7,600	13.00	19.00
Mixed grains.....	2,500	2,500	88,000	155,000	35.00	62.00
Potatoes.....	17,000	15,000	3,995,000	3,110,000	233.15	207.30
Turnips, mangolds, etc.	3,200	3,400	1,351,000	1,987,000	415.90	584.35
			tons	tons	tons	tons
Hay and clover.....	139,000	145,000	317,000	306,000	2.28	2.11
Fodder corn.....	400	400	3,000	3,000	8.00	7.66
Alfalfa.....	6,700	6,700	28,000	31,000	4.20	4.60

II. QUALITY AND VALUE OF FIELD CROPS IN CANADA IN 1912-1913

CROPS	Weight per Measured Bus.		Average Price per Ton		Total Value	
	1912	1913	1912	1913	1912	1913
	lb.	lb.	\$	\$	\$	\$
Canada—						
Fall wheat.....	60.21	60.25	.84	.80	17,157,000	18,185,000
Spring wheat.....	58.90	60.37	.60	.66	121,933,000	138,277,000
All wheat.....			.62	.67	139,090,000	156,462,000
Oats.....	35.40	36.48	.32	.32	126,304,000	128,893,000
Barley.....	47.59	48.41	.45	.42	22,354,000	20,144,000
Rye.....	54.84	55.66	.72	.66	1,755,000	1,524,000
Peas.....	56.88	60.00	1.26	1.11	4,944,400	4,382,000
Beans.....	59.05	59.70	2.18	1.88	2,008,000	1,505,000
Buckwheat.....	47.62	50.32	.62	.64	6,544,000	5,320,000
Mixed grains.....	44.48	44.74	.58	.55	10,194,000	8,685,000
Flax.....	54.88	55.79	.90	.97	23,608,000	17,084,000
Corn for husking.....	55.67	56.27	.62	.64	10,540,700	10,784,300

Potatoes.....			.44	.49	37,329,000	38,418,000
Turnips, mangolds, etc.....			.24	.28	18,924,000	18,643,000
			ton	ton		
Hay and clover.....			11.09	11.48	134,338,000	124,696,000
Fodder corn.....			4.93	4.78	14,977,000	12,506,000
Sugar beets.....			5.00	6.12	1,005,000	906,000
Alfalfa.....			12.00	11.85	3,429,000	2,819,200
Prince Edward Island—						
Spring wheat.....	58.93	59.50	.96	1.00	559,000	628,000
Oats.....	37.16	36.35	.43	.37	3,164,000	2,273,000
Barley.....	47.75	48.76	.65	.59	94,000	65,000
Peas.....	59.00	58.25	1.14	1.69	2,000	3,000
Buckwheat.....	46.55	47.67	.64	.64	64,000	42,000
Mixed grains.....	44.35	44.47	.49	.48	174,000	148,000
Potatoes.....			.26	.28	1,753,000	1,741,000
Turnips, mangolds, etc.....			.21	.24	754,000	966,000
			ton	ton		
Hay and clover.....			11.64	10.76	2,884,000	3,658,000
Fodder corn.....			4.00	2.50	6,000	8,500
Alfalfa.....			10.00	11.00	2,000	3,000
Nova Scotia—						
			bush.	bush.		
Spring wheat.....	58.82	59.04	1.08	1.14	286,000	304,000
Oats.....	33.41	34.68	.53	.53	1,732,000	1,744,000
Barley.....	48.06	48.59	.77	.75	110,000	101,000
Rye.....	55.20	58.33	.82	.97	4,000	8,000
Peas.....	60.43	59.36	1.82	1.85	9,000	12,000
Beans.....	59.73	59.09	2.51	2.40	60,000	53,000
Buckwheat.....	47.72	46.83	.65	.66	192,000	183,000
Mixed grains.....	44.10	43.35	.68	.65	102,000	93,000
Corn for husking.....	58.33	55.00	.84	.69	6,000	2,000
Potatoes.....			.47	.52	4,440,000	2,792,000
Turnips, mangolds, etc.....			.34	.36	1,906,000	1,685,000
			ton	ton		
Hay and clover.....			12.82	11.57	10,545,000	10,135,000
Fodder corn.....			5.00	4.88	27,000	19,500
Alfalfa.....			12.00	14.00	1,000	1,400
New Brunswick—						
			bush.	bush.		
Spring wheat.....	56.62	59.31	.75	1.12	177,000	301,000
Oats.....	34.20	34.43	.53	.51	2,972,000	3,032,000
Barley.....	46.88	48.21	.66	.69	49,000	51,000
Peas.....	53.88	59.46	1.53	1.49	15,000	16,000
Beans.....	58.14	59.67	2.85	2.46	18,000	11,000
Buckwheat.....	47.14	48.10	.62	.54	969,000	962,000
Mixed grains.....	43.67	42.30	.73	.59	21,000	18,000
Corn for husking.....			1.00	.80	700	1,300
Potatoes.....			.42	.44	3,174,000	4,677,000
Turnips, mangolds, etc.....			.32	.38	871,000	1,271,000
			ton	ton		
Hay and clover.....			10.12	10.91	9,018,000	7,615,000
Fodder corn.....			6.13	3.00	8,000	5,000
Alfalfa.....			10.00	12.00	3,000	4,800
Quebec—						
			bush.	bush.		
Spring wheat.....	57.96	59.71	1.18	1.21	1,449,000	1,275,000
Oats.....	33.93	36.85	.54	.48	18,099,000	18,732,000
Barley.....	46.95	48.46	.79	.77	1,759,000	1,743,000
Rye.....	53.57	54.56	.95	1.06	1164,000	165,000
Peas.....	53.96	61.03	2.03	1.97	911,000	888,000
Beans.....	57.31	60.16	2.55	2.31	214,000	224,000
Buckwheat.....	47.27	47.88	.73	.75	2,259,000	1,920,000
Mixed grains.....	44.21	46.56	.67	.66	1,864,000	1,892,000
Flax.....	53.07	55.10	1.76	1.95	15,000	18,000
Corn for husking.....	55.71	55.88	1.03	1.00	490,000	586,000

Potatoes.....			.35	.46	5,580,000	9,432,000
Turnips, mangolds, etc. ....			.28	.36	856,000	1,182,000
			ton	ton		
Hay and clover.....			9.36	12.08	35,492,000	49,154,000
Fodder corn.....			3.79	5.20	962,000	1,326,000
Alfalfa.....			9.00	8.30	87,000	52,000
Ontario—						
			bush.	bush.		
Fall wheat.....	60.53	60.16	.92	.85	13,950,000	15,019,000
Spring wheat.....	57.93	59.33	.88	.86	1,987,000	1,877,000
All wheat.....			.91	.85	15,937,000	16,896,000
Oats.....	34.38	34.08	.41	.38	39,792,000	39,960,000
Barley.....	47.45	48.08	.61	.56	9,207,000	8,170,000
Rye.....	55.70	55.76	.75	.69	1,283,000	1,081,000
Peas.....	58.95	59.31	1.16	.99	3,914,000	3,397,000
Beans.....	61.27	59.17	2.13	1.79	1,706,000	1,199,000
Buckwheat.....	48.29	47.46	.56	.60	3,060,000	2,213,000
Mixed grains.....	46.96	43.53	.58	.53	7,862,000	6,412,000
Flax.....	52.82	53.56	1.62	1.39	231,000	228,000
Corn for husking.....	55.50	56.75	.61	.63	10,044,000	10,195,000
Potatoes.....			.59	.65	13,387,000	11,768,000
Turnips, mangolds, etc. ....			.19	.22	10,791,000	9,662,000
			ton	ton		
Hay and clover.....			12.04	11.07	65,088,000	43,627,000
Fodder Corn.....			4.84	4.56	12,997,000	10,246,000
Sugar beets.....			5.00	6.20	938,000	856,000
Alfalfa.....			11.75	12.03	2,478,000	1,925,000
Manitoba—						
			bush.	bush.		
Fall wheat.....	59.13	61.50	.67	.69	223,000	268,000
Spring wheat.....	60.77	60.83	.67	.71	41,998,000	37,590,000
All wheat.....			.67	.71	42,221,000	37,858,000
Oats.....	35.63	36.32	.28	.28	16,003,000	15,893,000
Barley.....	47.47	47.57	.37	.34	5,855,000	4,864,000
Rye.....		60.00	.58	.58	61,000	60,000
Peas.....			1.50	.....	15,000	.....
Mixed grains.....			.45	.29	31,000	12,000
Flax.....	55.76	56.16	1.04	1.05	1,302,000	664,000
Potatoes.....			.35	.36	2,164,000	1,843,000
Turnips, mangolds, etc.. ....			.38	.41	551,000	415,000
			ton	ton		
Hay and clover.....			9.40	8.64	2,434,000	2,074,000
Fodder Corn.....			11.00	8.50	924,000	757,000
Alfalfa.....			9.20	10.67	86,000	117,000
Saskatchewan—						
Fall wheat.....	59.50	59.78	.76	.71	49,000	67,000
Spring wheat.....	59.63	61.23	.56	.64	59,861,000	77,738,000
All wheat.....			.56	.64	59,910,000	77,805,000
Oats.....	36.64	37.78	.23	.25	27,033,000	28,528,000
Barley.....	48.15	48.86	.33	.30	3,166,000	3,126,000
Rye.....			.56	.40	32,000	27,000
Peas.....			1.00	.85	11,000	6,000
Mixed grains.....			.60	.40	44,000	31,000
Flax.....	55.32	56.04	.89	.95	20,503,000	14,800,000
Potatoes.....			.40	.47	2,621,000	2,415,000
Turnips, mangold, etc... ..			.42	.50	1,749,000	1,653,000
			ton	ton		
Hay and clover.....			7.71	7.38	693,000	841,000
Fodder Corn.....			8.00	8.00	16,000	88,000
Alfalfa.....			11.66	15.25	35,000	56,000
Alberta—						
			bush.	bush.		
Fall wheat.....	59.63	60.96	.59	.62	2,731,000	2,630,000
Spring wheat.....	58.01	61.12	.53	.61	15,728,000	18,379,000
All wheat.....			.54	.61	18,459,000	21,009,000

Oats.....	38.94	38.67	.24	.24	16,231,000	17,170,000
Barley.....	48.12	49.06	.33	.31	2,039,000	1,964,000
Rye.....	54.00	57.07	.56	.46	211,000	183,000
Peas.....			.93	.85	8,400	7,000
Mixed grains.....			.40	.34	39,000	25,000
Flax.....	54.76	56.26	.92	1.19	1,557,000	1,374,000
Potatoes.....			.39	.39	2,252,000	1,697,000
Turnips, mangolds, etc. ....			.57	.50	730,000	617,000
			ton	ton		
Hay and clover.....			9.09	8.69	2,644,000	2,390,000
Fodder Corn.....			8.50	9.00	10,000	20,000
Sugar beets.....			5.00	5.00	67,000	50,000
Alfalfa.....			10.70	8.25	256,000	206,000
British Columbia—			bush.	bush.		
Fall wheat.....	58.50	59.25	1.03	1.01	204,000	201,000
Spring wheat.....	60.25	60.00	.93	.99	188,000	185,000
All wheat.....			.98	1.00	392,000	386,000
Oats.....	35.00	40.83	.51	.58	1,278,000	1,561,000
Barley.....	48.00	48.00	.64	.68	75,000	60,000
Peas.....	62.50	63.00	1.38	1.50	59,000	53,000
Beans.....			2.00	2.40	10,000	18,000
Mixed grains.....			.65	.35	57,000	54,000
Potatoes.....			.49	.66	1,958,000	2,053,000
Turnips, mangolds, etc. ....			.53	.60	716,000	1,192,000
			ton	ton		
Hay and clover.....			17.45	17.00	5,540,000	5,202,000
Fodder corn.....			9.00	12.00	27,000	36,000
Alfalfa.....			17.00	14.66	481,000	454,000

The total yields, the yields per acre and the average yields per bushel, as given in Table I, relate to bushels of the Canadian legal weight for each grain, viz., 60 lb. per bushel for wheat, peas and beans, 56 lb. for corn, rye and flaxseed, 48 lb. for barley and buckwheat and 34 lb. for oats. In Table II, the average weight per measured bushel represents the natural weight of the grain and is an indication of its quality, due to the character of the season. For spring wheat, oats, barley and buckwheat the weights per measured bushel in 1913 are higher than in any previous year recorded.

Wheat, Oats and Barley in the Northwest Provinces. Tables III and IV give the areas and total yields of wheat, oats and barley in the three Northwest provinces for the years 1900, 1905, 1906, 1910, 1911, 1912 and 1913.

III. COMPARATIVE AREAS OF WHEAT, OATS AND BARLEY IN THE NORTHWEST PROVINCES FOR THE YEARS 1900-05-06-10-11-12-13.

Provinces	1900	1905	1906	1910	1911	1912	1913
	acres	acres	acres	acres	acres	acres	acres
N. W. Provinces...							
Wheat.....	2,495,466	3,941,369	5,062,493	7,867,894	9,991,281	10,011,000	10,036,000
Oats.....	833,390	1,697,170	2,309,439	3,880,604	4,861,563	5,365,000	5,792,000
Barley.....	162,557	370,850	522,734	667,072	886,225	960,000	1,025,000
Manitoba—							
Wheat.....	1,965,193	2,417,253	2,721,079	2,760,371	3,094,833	2,839,000	2,804,000
Oats.....	573,848	779,279	931,282	1,209,173	1,307,434	1,348,000	1,398,000
Barley.....	139,660	249,218	336,986	416,016	448,105	481,000	496,000
Saskatchewan—							
Wheat.....	487,170	1,376,281	2,117,484	4,228,222	5,256,474	5,582,000	5,720,000
Oats.....	141,517	606,346	901,646	1,888,359	2,332,912	2,556,000	2,755,000
Barley.....	11,798	40,732	77,573	129,621	273,988	292,000	332,000
Alberta—							
Wheat.....	43,103	147,835	223,930	879,301	1,639,974	1,590,000	1,512,000
Oats.....	118,025	311,545	476,511	783,072	1,221,217	1,461,000	1,639,000
Barley.....	11,099	80,900	108,175	121,435	164,132	187,000	198,000

IV. COMPARATIVE YIELDS OF WHEAT, OATS AND BARLEY IN THE NORTHWEST PROVINCES FOR THE YEARS 1900-05-06-10-11-12-13.

Provinces	1900	1905	1906	1910	1911	1912	1913
	bush.	bush.	bush.	bush.	bush.	bush.	bush.
N.W. provinces							
Wheat.....	23,456,859	82,461,627	110,586,824	110,165,155	208,366,000	204,280,000	209,262,000
Oats.....	16,653,681	68,810,855	110,569,628	105,400,393	176,292,000	242,321,000	242,413,000
Barley.....	3,141,121	10,971,755	18,684,609	12,047,806	27,966,000	31,600,000	31,060,000
Manitoba—							
Wheat.....	18,352,929	47,626,586	54,472,198	34,125,949	62,689,000	63,017,000	53,331,000
Oats.....	10,952,365	31,458,692	44,643,300	30,378,379	60,037,000	57,154,000	56,759,000
Barley.....	2,666,567	7,544,150	11,979,554	6,506,634	14,949,000	15,826,000	14,305,000
Saskatchewan—							
Wheat.....	4,306,091	31,799,198	50,182,359	66,978,996	109,075,000	106,960,000	121,559,000
Oats.....	2,270,057	25,623,849	41,899,257	58,922,791	107,594,000	117,537,000	114,112,000
Barley.....	187,211	1,196,419	2,828,587	3,061,007	8,661,000	9,595,000	10,421,000
Alberta—							
Wheat.....	797,839	3,035,843	5,932,267	9,060,210	36,602,000	34,303,000	34,372,000
Oats.....	3,791,259	11,728,314	24,027,071	16,099,223	59,034,000	67,630,000	71,542,000
Barley.....	287,343	2,231,186	3,876,468	2,480,165	4,356,000	6,179,000	6,334,000

Numbers of Farm Live Stock. Table V gives the latest estimates of the numbers of farm live stock, for the five years 1909 to 1913, as published by the Census and Statistics Office of the Department of Trade and Commerce.

V. NUMBERS OF FARM LIVE STOCK, 1909 - 1913

Live stock	1909	1910	1911	1912	1913
	No.	No.	No.	No.	No.
Canada—					
Horses.....	2,132,489	2,213,199	2,595,912	2,692,357	2,866,008
Milch cows.....	2,849,305	2,853,957	2,594,179	2,604,488	2,740,434
Other cattle.....	4,384,779	4,250,963	3,939,257	2,827,373	3,915,687
Sheep.....	2,705,390	2,598,470	2,175,302	2,082,381	2,128,531
Swine.....	2,912,509	2,753,964	3,610,428	3,477,310	3,448,326
Prince Edward Island—					
Horses.....	34,121	34,121	35,935	35,638	35,952
Milch cows.....	53,915	55,365	52,109	49,415	48,565
Other cattle.....	58,013	57,648	68,287	64,688	64,261
Sheep.....	109,244	110,599	91,232	87,793	85,660
Swine.....	47,853	48,623	56,377	50,463	43,762
Nova Scotia—					
Horses.....	68,128	68,721	61,355	61,735	62,550
Milch cows.....	147,663	148,948	129,302	130,104	130,468
Other cattle.....	182,507	180,189	158,122	156,051	153,726
Sheep.....	361,444	358,263	220,907	216,135	217,734
Swine.....	70,508	69,958	63,322	61,194	56,580
New Brunswick—					
Horses.....	66,496	66,855	65,458	65,582	65,103
Milch cows.....	122,577	122,136	108,532	110,507	106,904
Other cattle.....	113,850	110,389	113,659	113,136	107,864
Sheep.....	215,289	203,620	158,216	148,723	135,115
Swine.....	94,140	91,250	87,391	85,905	77,014
Quebec—					
Horses.....	362,796	368,419	369,237	367,402	369,974
Milch cows.....	856,579	856,151	753,134	755,770	761,816
Other cattle.....	622,888	600,277	697,860	695,906	693,540
Sheep.....	570,342	549,068	637,062	620,881	602,751
Swine.....	670,042	651,415	793,348	747,254	661,768
Ontario—					
Horses.....	821,011	802,949	811,585	805,271	902,628
Milch cows.....	1,260,572	1,243,680	1,032,979	1,033,392	1,141,071
Other cattle.....	1,771,433	1,629,364	1,471,694	1,380,890	1,460,015



Barn Raising in New Ontario

New or Northern Ontario is one of the two great sections into which the Premier Province of the Dominion of Canada is divided.

It covers an area of 330,000 square miles, containing millions of acres of the very best agricultural land, producing first class wheat, oats, barley and first quality of hay, clover, roots and vegetables.

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Minister of Agriculture

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Toronto

Sheep.....	1,118,945	1,032,227	743,483	677,462	705,848
Swine.....	1,586,565	1,481,058	1,864,165	1,693,594	1,652,440
Manitoba—					
Horses.....	237,161	244,987	280,374	293,776	304,088
Milch cows.....	167,442	164,746	155,337	148,471	152,792
Other cattle.....	333,752	314,995	279,776	267,130	256,926
Sheep.....	29,074	30,266	37,322	40,800	42,840
Swine.....	172,374	142,312	188,416	183,370	184,745
Saskatchewan—					
Horses.....	279,063	332,922	507,400	551,645	580,386
Milch cows.....	124,186	138,455	181,146	184,896	194,843
Other cattle.....	391,789	431,164	452,466	461,244	468,255
Sheep.....	129,630	135,360	114,216	114,810	115,568
Swine.....	131,757	125,788	286,295	344,298	386,784
Alberta—					
Horses.....	263,713	294,225	407,153	451,573	484,809
Milch cows.....	116,371	124,470	147,687	157,922	168,376
Other cattle.....	910,547	926,937	592,163	587,307	610,917
Sheep.....	171,422	179,067	133,592	135,075	178,015
Swine.....	139,270	143,560	237,510	278,747	350,692
British Columbia—					
Horses.....			57,415	59,735	760,518
Milch cows.....			33,953	34,011	735,599
Other cattle.....			105,230	101,021	100,183
Sheep.....			39,272	40,702	45,000
Swine.....			33,604	32,485	34,541

NOTE.—The numbers of live stock in 1911 are the actual returns of the Census of that year. The numbers for 1912 and 1913 are estimates based on the Census returns of 1911.

TABLE VI. CHEESE, BUTTER AND CONDENSED MILK FACTORIES.

From the Canada Year Book of 1912, shows by provinces the number of factories and creameries and the quantity and value of cheese and butter produced for each of the years 1900, 1907 and 1910.

VI.—CHEESE AND BUTTER PRODUCTION IN CANADA
1900, 1907 and 1910.

Provinces		Factories and Cre'm's	Cheese		Butter	
			No.	lb.	lb.	\$
Alberta.....	1900	18		27,693	406,970	82,630
	1907	53		197,911	1,507,697	362,782
	1910	56		193,479	2,149,121	533,422
British Columbia...	1900	8			395,808	105,690
	1907	12		90,400	1,283,797	414,680
	1910	8			1,206,202	420,683
Manitoba.....	1900	69		1,289,413	1,557,010	292,247
	1907	51		1,266,592	1,561,398	388,427
	1910	42		694,713	2,050,487	511,972
New Brunswick....	1900	68		1,892,686	287,814	58,589
	1907	53		1,205,773	969,167	231,102
	1910	42		1,166,243	849,633	212,205
Nova Scotia.....	1900	33		568,147	334,211	68,686
	1907	13		181,956	198,238	49,047
	1910	16		264,243	354,785	88,481

Ontario.....	1900	1,336	131,967,612	13,440,987	7,559,542	1,527,935
	1907	1,209	129,693,010	15,106,030	8,862,618	2,120,457
	1910	1,248	136,093,951	14,769,566	14,085,655	3,379,063
Prince Edward Island.....	1900	47	4,457,719	449,400	562,220	118,402
	1907	43	2,250,316	251,410	358,422	89,339
	1910	44	3,293,755	354,378	670,908	156,478
Quebec.....	1900	1,992	80,630,199	7,957,621	24,625,000	4,916,756
	1907	2,074	69,887,625	7,888,109	31,056,154	7,256,629
	1910	2,142	58,171,091	6,195,254	41,782,678	9,961,732
Saskatchewan.....	1900	5	.....	.....	339,014	770,037
	1907	7	15,000	1,950	132,803	36,599
	1910	27	26,730	3,396	1,548,696	381,809
Totals for Canada..	1900	3,576	220,833,469	22,221,430	36,066,739	7,240,972
	1907	3,515	204,788,583	23,597,639	45,930,294	10,949,062
	1910	3,625	199,904,205	21,587,124	64,698,165	15,645,845

In 1900 there were four condensed milk factories, situated two in Nova Scotia, one in Ontario and one in Prince Edward Island. The total value of their products was \$269,520. In 1907 there were seven of these factories, the three additional establishments being situated, one in Ontario and two in Quebec. These produced 10,334,485 lb. of condensed and evaporated milk and 1,841,650 lb. of condensed cream, the total value of the products being \$910,842.

Table VII. shows by provinces for the year 1910 the number of condensed milk factories and the quantity and value of the products:

VII.—QUANTITY AND VALUE OF CONDENSED MILK PRODUCTS BY PROVINCES, 1910.

Provinces	F'c- t'r's Quantity		Value	Provinces	F'c- t'r's Quantity		Value
	No.	lb.			No.	lb.	
British Columbia..	1	1,000,000	44,326	Prince Edward Island.....	1	794,070	50,900*
Nova Scotia...	2	2,020,200	133,956	Quebec.....	1	2,464,546	250,000
Ontario.....	6	21,552,780	1,335,689				
				Total.....	11	27,831,596	1,814,871

* Including \$900 value of other products.

The value of condensed milk, etc., was thus \$1,814,871 in 1910, as compared with \$269,520 in 1900. The total value of cheese, butter and condensed milk was \$39,047,840 in 1910, as compared with \$29,731,922 in 1900, which is an increase in the decade of 31.33 p.c. The average selling price of cheese in 1910 was 10.80 cents, as compared with 10.06 cents in 1900 and of butter 24.18 cents, as compared with 20.08 cents.

FARM POULTRY, BEES AND ANIMAL PRODUCTS

During the year 1913 the Census and Statistics Office has published in bulletins by provinces the agricultural data collected at the Census of 1911. In Tables VIII and IX we give, as extracted from these bulletins, the numbers and values of farm poultry and bees for the years 1901 and 1911, and in Table X the quantities and values of animal products for the years 1900 and 1910.

VIII.—NUMBERS OF FARM POULTRY AND BEES, 1901 and 1911

Province and year	Turkeys	Geese	Ducks	Hens and Chickens	Hives of Bees
	No.	No.	No.	No.	No.
Canada.....1901	584,569	405,081	282,575	16,562,207	193,534
1911	854,236	630,013	530,232	29,555,723	185,617
Prince Edward Island....1901	15,509	36,826	13,436	515,399	86
1911	9,852	42,752	11,040	697,292	159
Nova Scotia.....1901	23,564	22,189	12,801	738,125	4,537
1911	11,945	18,782	10,848	910,408	5,744
New Brunswick.....1901	30,532	30,276	11,963	648,893	3,290
1911	21,192	23,303	14,196	914,868	2,744
Quebec.....1901	80,769	62,679	20,080	3,066,304	65,986
1911	166,209	102,949	60,098	4,823,472	45,429
Ontario.....1901	389,431	234,415	178,215	9,632,961	116,403
1911	416,706	364,295	289,681	13,217,146	124,237
Manitoba.....1901	28,450	10,297	24,381	1,098,920	735
1911	79,639	28,472	35,411	2,441,655	2,841
Saskatchewan.....1901	7,155	3,023	8,181	277,085	24
1911	72,616	22,999	54,968	3,242,820	253
Alberta.....1901	6,369	1,590	4,147	238,040	89
1911	67,151	19,653	26,092	2,340,221	414
British Columbia.....1901	2,790	3,786	9,371	346,480	2,384
1911	8,926	6,808	27,898	967,841	3,796

IX.—VALUES OF FARM POULTRY AND BEES, 1901 AND 1911

Provinces	Farm Poultry		Hives of Bees	
	1901	1911	1901	1911
	\$	\$	\$	\$
Canada.....	5,723,890	15,047,009	793,711	1,002,535
Prince Edward Island.....	147,159	269,998	526	970
Nova Scotia.....	218,223	325,232	4,537	5,744
New Brunswick.....	213,319	348,133	13,014	13,030
Quebec.....	1,166,314	2,743,370	251,203	252,160
Ontario.....	3,125,166	6,214,868	504,126	673,687
Manitoba.....	417,586	1,116,096	6,127	22,620
Saskatchewan.....	116,582	1,987,975	1,152	1,925
Alberta.....	109,794	1,358,012	1,027	2,912
British Columbia.....	209,747	683,325	11,999	29,487

X.—QUANTITIES AND VALUES OF ANIMAL PRODUCTS, 1900 and 1910

Description	1900	1910	1900	1910
	lb.	lb.	\$	\$
Canada—				
Wool.....	10,647,597	7,009,863	1,887,464	1,834,150
Milk.....		9,871,178,103	66,470,953	109,340,024
Cream.....		86,877,328		8,249,471

Home-made butter.....	105,343,076	138,098,534	39,889,953
Home-made cheese.....		1,363,261	153,036
Honey.....	3,569,567	6,499,177	823,627
	doz.	doz.	
Eggs.....	84,134,802	143,002,132	10,286,828
Prince Edward Island—	lb.	lb.	23,501,173
Wool.....	420,438	312,653	84,524
Milk.....		161,137,906	1,111,614
Cream.....		1,516,612	96,348
Home-made butter.....	1,398,112	2,308,746	461,304
Home-made cheese.....		9,427	938
Honey.....	2,177	1,844	271
	doz.	doz.	455
Eggs.....	2,426,251	3,533,079	248,423
Nova Scotia—	lb.	lb.	522,928
Wool.....	872,544	698,091	187,097
Milk.....		425,785,151	2,885,997
Cream.....		1,631,729	602,061
Home-made butter.....	9,060,742	11,665,130	2,251,108
Home-made cheese.....		200,170	18,037
Honey.....	15,122	25,376	2,187
	doz.	doz.	3,876
Eggs.....	4,419,239	5,183,295	543,108
New Brunswick—	lb.	lb.	929,413
Wool.....	709,816	487,401	145,046
Milk.....		354,581,927	2,260,537
Cream.....		2,083,855	292,576
Home-made butter.....	7,842,533	9,152,326	1,939,459
Home-made cheese.....		3,717	447
Honey.....	41,506	42,644	5,432
	doz.	doz.	5,984
Eggs.....	3,120,012	3,878,149	372,745
Quebec—	lb.	lb.	665,265
Wool.....	2,772,894	1,901,680	570,493
Milk.....		2,741,001,497	20,207,826
Cream.....		20,144,912	31,663,220
Home-made butter.....	18,357,188	19,701,525	1,566,517
Home-made cheese.....		349,763	13,961,644
Honey.....	1,090,599	1,512,119	42,870
	doz.	doz.	280,248
Eggs.....	15,502,415	20,076,629	2,007,320
Ontario—	lb.	lb.	4,092,695
Wool.....	5,017,585	2,758,699	807,276
Milk.....		4,293,847,581	34,776,330
Cream.....		41,132,973	43,332,047
Home-made butter.....	55,378,568	63,321,735	3,322,332
Home-made cheese.....		295,718	13,734,867
Honey.....	2,366,144	4,186,760	35,956
	doz.	doz.	516,180
Eggs.....	49,779,845	78,598,529	5,756,221
Manitoba—	lb.	lb.	10,730,011
Wool.....	137,469	94,206	15,272
Milk.....		532,504,331	2,792,606
Cream.....		7,485,189	6,077,982
Home-made butter.....	8,676,661	10,937,864	849,303
Home-made cheese.....		327,289	2,571,143
Honey.....	16,242	62,047	32,361
	doz.	doz.	9,057
Eggs.....	5,038,062	9,646,823	605,534
Saskatchewan—	lb.	lb.	1,765,189
Wool.....	344,869	328,397	36,180
Milk.....		694,106,781	729,574
Cream.....		3,199,829	7,566,007
Home-made butter.....	2,271,455	12,053,201	460,849
			2,749,637

Home-made cheese.....		27,730		3,454
Honey.....	190	1,628	30	609
	doz.	doz.		
Eggs.....	1,216,385	11,447,036	161,652	2,252,253
Alberta—	lb.	lb.		
Wool.....	281,633	297,813	33,288	41,670
Milk.....		520,627,878	546,476	7,855,751
Cream.....		5,752,288		588,388
Home-made butter.....	1,265,262	7,689,402		1,820,751
Home-made cheese.....		141,964		18,126
Honey.....	3,750	5,108	651	931
	doz.	doz.		
Eggs.....	980,852	7,013,907	165,196	1,515,543
British Columbia—	lb.	lb.		
Wool.....	90,349	130,923	8,288	18,751
Milk.....		147,585,051		2,620,495
Cream.....		3,929,941	1,159,993	471,097
Home-made butter.....	1,092,555	1,268,605		400,040
Home-made cheese.....		7,483		847
Honey.....	33,837	31,651	4,940	6,287
	doz.	doz.		
Eggs.....	1,651,741	3,624,685	426,629	1,027,876

PROVINCIAL GOVERNMENTS

In addition to the agricultural statistics of the Dominion Government annual returns are published by the Departments of Agriculture of certain of the provinces. These returns often differ materially from those of the Dominion Government. The following statements of the principal field crops and numbers of live stock in 1913 are compiled from the annual reports of those provinces whose agricultural returns for 1913 have already been issued.

PRINCE EDWARD ISLAND: FIELD CROPS, 1913

Crops	Area	Yield	Value	Crops	Area	Yield	Value
	acres	bush.	\$		acres	bush.	\$
Wheat..	29,500	500,000	450,000	Peas, beans and vetches	500	10,000	15,000
Oats... 175,000		6,550,000	2,420,000	Potatoes....	34,000	4,500,000	1,350,000
Barley.. 4,200		140,000	80,000	Roots.....	8,500	4,250,000	625,000
Mixed grains.	12,000	550,000	203,500	Hay.....	190,000	250,000	3,000,000
Buck- wheat	3,500	85,000	42,500				

NOVA SCOTIA: FIELD CROPS, 1913

Crops	Area	Yield per Acre	Total Yield	Crops	Area	Yield per acre	Total Yield
	acres	bush.	bush.		acres	bush.	bush.
Wheat.....	13,726	25.0	343,150	Potatoes....	29,949	190.0	5,690,310
Oats.....	102,054	37.0	3,775,998	Turnips....	10,200	604.0	6,160,800
Barley.....	5,978	31.0	185,318	Mangols....	1,123	506.0	568,238
Buckwheat....	11,580	25.0	289,500			tons	tons
Peas.....	209	17.0	3,553	Hay.....	505,207	1.8	909,372
Beans.....	950	17.0	16,150	Corn for			
Rye.....	919	22.0	20,218	forage....	640	10.0	6,400
Mixed				Other forage			
grains.....	4,356	34.0	137,104	crops....	1,300	10.0	13,000

Corn for husking.....	142	40.0	5,680	Alfalfa.....	35	.....	.....
				Flax.....	6	.....	.....
				Other roots	1,100	.....	.....
				Apples.....	.....	barrels	585,000

ONTARIO: FIELD CROPS, 1913

Crops	Area		Yield		Yield per acre	
	1912	1913	1912	1913	1912	1913
	acres	acres	bush.	bush.	bush.	bush.
Fall wheat.....	759,888	646,533	15,039,885	15,945,717	19.8	24.7
Spring wheat.....	123,080	116,581	2,302,339	2,068,951	18.0	17.7
All wheat.....	882,968	763,114	17,342,224	18,014,668	19.6	23.6
Barley.....	647,382	623,658	19,232,275	18,255,958	29.7	29.3
Oats.....	2,601,735	2,699,459	98,444,807	98,426,902	37.8	36.5
Rye.....	105,949	118,429	1,839,675	1,979,775	17.4	16.7
Buckwheat.....	205,893	228,279	5,414,796	4,012,418	26.3	17.6
Peas.....	221,524	177,303	3,667,005	3,108,263	16.6	17.5
Beans.....	69,703	66,639	1,182,132	1,021,243	17.0	15.3
Corn for husking.....	301,251	299,871	21,969,468	22,214,014	72.9	74.1
Corn for silo.....	377,982	388,138	3,969,597	4,059,345	10.5	10.4
Potatoes.....	158,888	159,661	21,346,394	19,124,115	134.0	120.0
Carrots.....	2,742	2,400	747,207	592,016	273.0	247.0
Mangolds.....	60,103	54,568	27,671,114	21,935,847	460.0	402.0
Turnips.....	101,529	97,572	49,561,566	41,889,894	488.0	429.0
Mixed grains.....	448,402	414,517	16,382,161	15,113,480	36.5	36.5
Sugar beets.....	21,054	19,083	7,819,066	6,389,177	371.0	335.0
Hay, clover and alfalfa	3,367,369	3,428,846	5,220,713	3,924,563	1.5	1.1

ONTARIO: LIVE STOCK, 1912-1913

Description	1912	1913	Description	1912	1913
	No.	No.		No.	No.
Horses.....	742,139	751,726	Turkeys.....	660,843	699,861
Milch cows.....	1,044,177	1,032,039	Geese.....	362,674	389,173
Other cattle.....	1,580,603	1,596,806	Ducks.....	415,251	497,734
Sheep and lambs...	1,021,848	996,155	Other fowls....	11,586,215	11,924,615
Swine.....	1,702,652	1,618,734	Total poultry...	13,024,983	13,511,383

The wool clip in 1913 was 3,647,245 lb. as compared with 3,669,419 lb. in 1912.

MANITOBA: FIELD CROPS, 1912-1913

Crops	Area		Yield		Yield per acre	
	1912	1913	1912	1913	1912	1913
	acres	acres	bush.	bush.	bush.	bush.
Fall wheat.....	9,279	15,578	207,850	355,178	22.4	22.8
Spring wheat.....	2,814,083	3,125,640	58,225,729	62,400,276	20.7	20.0
All wheat.....	2,823,362	3,141,218	58,433,579	62,755,455	20.7	20.0
Oats.....	1,939,982	1,939,723	87,190,677	81,410,174	46.0	42.0
Barley.....	962,928	1,153,834	33,795,191	33,014,693	35.1	28.6

Flax.....	196,315	115,054	2,671,729	1,301,278	13.6	11.3
Rye.....	10,305	10,936	202,605	208,322	19.6	19.0
Peas.....	2,936	4,115	63,713	86,024	21.7	20.9
Potatoes.....	51,878	55,743	10,734,612	9,977,263	206.0	180.0
Roots.....	14,109	16,275	3,895,118	4,196,612	276.0	257.8
tons						
Brome grass.....	25,152	24,912	47,337	43,432	1.8	1.7
Rye grass.....	17,473	21,197	28,315	33,907	1.6	1.6
Timothy.....	114,899	118,812	192,783	181,407	1.6	1.5
Clover.....		5,328		9,732		1.8
Alfalfa.....	6,572	4,709	13,806	10,722	2.1	2.3
Fodder corn.....		20,223		119,764		5.9

MANITOBA: LIVE STOCK, 1912-1913

Year	Horses No.	Cattle No.	Sheep No.	Swine No.
1912	273,395	429,274	42,085	216,640
1913	300,753	456,936	52,142	248,254

Number of poultry disposed of by farmers in province, 1913:

Turkeys.....	176,964
Geese.....	79,940
Chickens.....	777,808

Amount expended in farm buildings in 1913.....\$3,380,345

Land prepared for Crop in 1913:

	acres
New breaking.....	155,942
Summer fallow.....	1,144,405
Fall ploughing.....	1,581,824

Dairy products, value in 1913:

Dairy butter.....	\$1,023,722.44
Creamery butter.....	1,080,646.05
Cheese.....	52,064.48

SASKATCHEWAN: FIELD CROPS, 1912-1913

Crops	Area		Yield		Yield per acre	
	1912	1913	1912	1913	1912	1913
	Acres	Acres	Bush.	Bush.	Bush.	Bush.
Wheat.....	5,384,092	5,760,249	107,167,700	112,369,405	19.9	19.9
Oats.....	2,421,932	2,638,562	107,619,948	110,210,436	44.4	41.7
Barley.....	267,139	307,177	8,319,584	9,279,263	31.1	30.2
Flax.....	1,111,651	967,137	14,171,214	11,654,280	12.7	12.0

SASKATCHEWAN: LIVE STOCK, 1912-1913

Year	Horses	Milch Cows	Other Cattle	Sheep	Swine	Poultry
	No.	No.	No.	No.	No.	No.
1912	592,220	258,235	562,590	128,198	324,880	4,759,954
1913	609,500	322,790	534,460	141,000	406,100	5,000,000

ALBERTA: FIELD CROPS, 1912-1913

Crops	Area		Yield		Yield per acre	
	1912	1913	1912	1913	1912	1913
	acres	acres	bush.	bush.	bush.	bush.
Fall wheat.....	120,811	77,299	2,395,875	1,395,382	19.83	18.

Spring wheat.....	957,874	1,000,030	17,434,774	19,000,570	18.20	19.
All wheat.....	1,078,685	1,077,329	19,830,649	20,395,952	18.38	19.
Oats.....	971,969	1,267,130	37,085,234	49,418,070	38.15	39.
Barley.....	225,055	376,698	6,287,112	10,547,544	27.94	28.
Flax.....	112,776	65,021	1,196,416	715,321	10.60	11.
Rye.....	2,493	15,889	54,119	349,558	21.70	22.
Speltz.....	774	7,243	11,528	108,645	14.89	15.
Potatoes.....	42,539	42,417	7,459,000	7,865,650	175.35	192.
Turnips.....	6,740	5,342	1,742,306	1,273,961	258.52	238.
Carrots.....	2,083	1,058	344,841	216,162	165.56	204.
Mangolds.....	869	878	410,910	313,404	447.85	357.

ALBERTA: LIVE STOCK, 1912-1913

Year	Horses	Dairy Cows	Other Cows	Beef Cattle	Other Cattle	Sheep	Swine
	No.	No.	No.	No.	No.	No.	No.
1912	557,571	164,989	142,243	161,985	475,247	366,946	536,915
1913	580,120	175,367	150,032	178,112	497,370	417,657	607,202

NUMBERS OF FARM LIVE STOCK IN PRINCIPAL COUNTRIES

(From the Year Book and Bulletins of the International Agricultural Institute).

Countries	Year	Horses	Cattle	Sheep	Swine
		No.	No.	No.	No.
Germany.....	1912	4,516,297	20,158,738	5,787,848	21,885,073
Austria.....	1910	1,802,848	9,160,009	2,428,101	6,432,080
Hungary.....	1913	2,005,019	6,206,867	6,659,858	6,824,657
France.....	1911	3,236,110	14,552,430	16,425,330	6,719,570
England and Wales.....	1913	1,402,146	5,716,944	17,130,286	2,101,902
Italy.....	1908	955,878	6,218,227	11,162,926	2,507,798
Russia in Europe.....	1912	23,860,178	34,547,348	*42,735,567	11,944,568
Russia in Asia.....	1912	6,865,878	7,381,247	*16,257,736	918,634
Canada.....	1913	2,866,008	6,656,121	2,128,531	3,448,326
United States.....	1913	20,567,000	56,527,000	51,482,000	61,178,000
India.....	1910	1,553,289	119,379,293	23,235,176	.....
Argentina.....	1911	8,994,031	28,786,168	80,401,486	2,900,000
Uruguay.....	1908	556,307	8,192,602	26,286,296	180,099
Union of South Africa.....	1911	719,414	5,796,949	30,656,659	1,081,600
Australia.....	1912	2,399,123	11,658,328	83,593,846	844,313

*Including goats.

CEREAL CROPS OF THE NORTHERN HEMISPHERE, 1912-1913

(From the Reports of the International Agricultural Institute).

Crops and Countries	1912	1913	p. c. of 1912	1912	1913	p. c. of 1912	Yield per acre
	000 acres	000 acres	p. c.	000 bush.	000 bush.	p. c.	bush. bush.
Wheat—							
Germany.....	4.758	4.878	102.5	171.077	160.225	106.8	33.61 35.09
Austria.....	3.114	2.998	96.3	69.639	59.636	85.6	22.30 19.93
Hungary.....	9.581	8.650	90.3	184.642	166.675	90.3	19.33 19.33
Spain.....	9.625	9.414	97.8	109.784	110.098	100.3	11.45 11.75
France.....	16.239	16.170	99.6	334.336	322.732	96.5	20.52 19.93
United Kingdom.....	1.971	1.790	90.9	57.402	56.691	98.8	29.14 31.67
Italy.....	11.751	11.842	100.8	165.721	214.407	129.4	14.13 18.14
Roumania.....	5.114	4.011	78.4	89.413	84.192	94.2	17.55 20.97
Russia in Europe.....	60.666	62.068	102.3	623.761	837.787	134.3	10.26 13.53
Russia in Asia.....	10.729	13.103	122.1	103.270	138.005	133.6	9.67 10.56
Canada.....	10.997	11.015	100.2	224.159	231.717	103.4	20.38 21.04

United States.....	45,815	49,602	108.3	730,279	753,245	103.1	15.91	15.17
India.....	31,141	29,569	95.0	370,514	358,389	96.7	11.90	12.19
Other countries.....	6,173	5,614	91.0	77,792	102,428	153.0	.....	.....
Total.....	227,674	230,724	101.3	3,300,937	3,593,227	108.9	14.50	15.58
Rye—								
Germany.....	15,489	15,850	102.3	456,604	481,174	105.4	29.47	30.43
Austria.....	5,022	4,853	96.6	117,113	106,472	90.9	23.26	21.99
Hungary.....	3,065	2,901	94.6	56,737	56,005	98.7	18.48	19.28
France.....	2,969	2,958	99.6	48,746	53,365	109.5	16.41	18.00
Russia in Europe.....	70,794	71,860	101.5	1,010,983	971,955	96.1	14.34	13.54
Russia in Asia.....	2,584	3,100	120.0	33,075	30,017	90.8	12.75	9.72
United States.....	2,117	2,134	100.8	35,664	34,789	97.5	16.89	16.25
Other countries.....	4,548	4,449	97.8	88,600	94,471	106.7	.....	.....
Total.....	106,588	108,105	101.4	1,847,523	1,828,245	99.0	17.15	16.91
Barley—								
Germany.....	3,928	4,087	104.0	159,926	168,711	105.5	40.71	41.26
Austria.....	2,634	2,699	102.5	78,382	80,390	102.6	29.74	29.74
Hungary.....	2,760	3,024	109.6	72,028	78,802	109.3	26.21	26.02
Spain.....	3,298	3,794	115.0	59,995	63,742	106.2	18.22	16.73
France.....	1,877	1,890	100.7	50,588	50,248	99.3	26.95	26.58
United Kingdom.....	1,814	1,930	106.4	60,632	68,356	112.7	33.46	35.50
Roumania.....	1,235	1,390	112.5	20,934	27,650	132.1	16.91	19.89
Russia in Europe.....	28,119	30,191	107.4	455,957	549,775	120.6	16.17	18.22
Russia in Asia.....	824	1,081	131.3	12,325	16,544	134.2	14.87	15.24
Canada.....	1,581	1,613	102.0	49,398	48,319	97.8	31.24	29.96
United States.....	7,530	7,255	96.3	223,819	173,297	77.4	29.74	23.98
Japan.....	3,132	3,106	99.2	99,574	101,074	101.5	31.78	32.53
Algeria.....	3,430	3,152	91.9	32,887	50,032	152.1	9.67	15.80
Other countries.....	2,554	2,371	109.8	44,579	51,280	114.9	.....	.....
Total.....	64,716	67,583	105.1	1,421,024	1,528,220	107.5	22.09	22.61
Oats—								
Germany.....	10,842	10,967	101.2	552,464	629,871	114.0	50.91	57.47
Austria.....	4,613	4,707	102.0	157,572	173,630	110.2	34.11	37.00
Hungary.....	2,712	3,122	115.1	75,582	96,751	128.0	27.82	30.96
Spain.....	1,279	1,341	104.9	21,680	25,260	116.5	17.06	18.89
France.....	9,840	9,881	100.4	334,205	352,338	105.4	33.85	35.69
United Kingdom.....	4,075	3,961	97.2	189,036	189,558	100.3	46.45	47.76
Italy.....	1,254	1,251	99.7	26,641	40,912	153.6	21.25	32.80
Roumania.....	943	1,290	136.8	20,101	34,496	171.6	21.25	26.77
Russia in Europe.....	41,218	41,778	101.4	916,014	1,036,239	113.1	22.30	24.93
Russia in Asia.....	4,810	5,734	119.2	89,888	125,449	139.6	18.63	21.78
Canada.....	9,966	10,434	104.7	391,629	404,669	103.3	39.29	38.78
United States.....	37,917	38,342	101.1	1,334,909	1,056,133	79.1	35.16	27.55
Other countries.....	2,929	3,022	103.1	124,531	149,537	120.4	.....	.....
Total.....	132,398	135,830	102.6	4,234,252	4,314,843	102.3	32.01	31.77
Corn—								
Hungary.....	6,023	6,422	106.6	176,695	184,755	104.6	29.31	28.84
Italy.....	3,938	3,954	100.4	98,669	108,263	109.7	25.01	27.40
Roumania.....	5,138	5,305	103.3	111,012	118,105	106.4	21.67	22.30
Russia in Europe.....	4,054	4,216	104.0	79,607	72,795	91.4	19.60	17.21
Russia in Asia.....	22	18	79.9	342	419	122.6	15.45	23.74
United States.....	107,084	105,821	98.8	3,124,720	2,446,968	78.3	29.16	23.10
Egypt.....	1,668	1,695	101.6	60,858	57,574	94.6	36.48	33.93
Other countries.....	2,389	2,295	96.0	61,581	58,688	91.5	.....	.....
Total.....	130,316	129,726	99.5	3,713,434	3,042,567	82.0	28.52	23.45
Flaxseed—								
Belgium.....	53	57	106.8	514	410	79.7	9.56	7.17
Roumania.....	78	67	86.0	718	531	74.0	9.08	7.81
Canada.....	2,022	1,553	76.8	26,130	17,539	67.1	12.92	11.30
United States.....	2,851	2,425	85.1	28,073	20,000	71.2	9.88	8.28
India.....	5,052	4,053	80.2	25,680	21,428	83.4	5.10	5.26
Other countries.....	17	26	158.8	138	188	136.9	.....	.....
Total.....	10,073	8,181	81.2	81,253	60,096	74.0	8.07	7.35

In Argentina the areas sown to the principal cereal crops for 1913-14 compared with 1912-13 are estimated as follows:

Crop	1912-13	1913-14	p.c. of increase
	acres	acres	acres
Wheat.....	17,095,900	16,242,000	295.0
Rye.....	99,600	127,300	230.6
Barley.....	266,700	417,600	156.6
Oats.....	2,946,400	3,086,300	104.7
Corn.....	4,283,100	4,396,000	102.6

LIVE STOCK DIRECTORY

AGRICULTURAL AND LIVE STOCK ASSOCIATIONS OF CANADA

With List of Officers for 1913.

Dominion Live Stock Association.

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President, J. A. Boag, Queenville, Ont.; Secretary, J. W. Wheaton, Toronto, Ont.

Hackney Horse Society.

President, A. E. Yeager, Simcoe, Ont.; Secretary, H. M. Robinson, Don Mills Road, Toronto, Ont.

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Mary of Silversprings, Champion Clyde Mare, Dominion Fair, Brandon, 1913

Dunbarton Farm

Dunbarton, Ontario

Clydesdales AND Holsteins

Quality and Breeding Unexcelled

Buy the Best, Breed Them Better

Thos. McGlashan, Supt.
DUNBARTON, ONTARIO

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Dominion Swine Breeders' Association.

President, J. C. Flatt, Hamilton, Ont.; Secretary, A. P. Westervelt, Toronto, Ont.

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Canadian Percheron Horse Breeders' Association.

Secretary, F. R. Pike, High River, Alta.

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Secretary, J. J. Dixon, Toronto, Ont.

Canadian Suffolk Horse Society.

Secretary, Arch. Jaques, Lamerton, Alta.

Canadian French Coach Horse Association.

Secretary, E. S. Richardson, Calgary, Alta.

Canadian Holstein-Friesian Association.

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Secretary, Lieut.-Col. D. McCrae, Guelph, Ont.

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Ontario Sheep Breeders' Association.

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Ontario Agricultural and Experimental Union.

President, T. H. Mason, Ottawa, Ont.; Secretary, Prof. C. A. Zavitz, Guelph, Ont.

Ontario Large Yorkshire Swine Breeders' Association.

President, Wm. Jones, Zenda; Secretary, A. F. Westervelt, Toronto.

Ontario Berkshire Breeders' Association.

President, E. J. McEwen, Kirch, Ont.; Secretary, A. P. Westervelt, Toronto, Ont.

Ontario Yorkshire Breeders' Association.

President, W. Jones, Zenda, Ont.; Secretary, A. P. Westervelt, Toronto.

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President, J. B. Muir, Ingersoll, Ont.; Secretary, F. Herns, London, Ont.

Poultry Association (Eastern).

President, Geo. A. Robertson, Ottawa, Ont.; Secretary, A. P. Westervelt, Toronto, Ont.

Poultry Association (Western).

President, L. T. Jarvis, Grimsby, Ont.; Secretary, A. P. Westervelt, Toronto, Ont.

Fruit Growers' Association.

President, D. Johnson, Forest; Secretary, P. W. Hodgetts, Toronto.

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President, F. Weir, Agincourt, Ont.; Secretary, J. Lockie Wilson, Toronto, Ont.

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Superintendent of Farmers' and Women's Institutes, and Director of Dairy Instruction—Geo. A. Putnam.

Director Live Stock Branch—R. Wade, B.S.A., Toronto.

Director Fruit Branch—P. W. Hodgetts.

Note.—The offices of the above are all in the Parliament Buildings, Toronto, Ont.

MANITOBA.

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New Brunswick Fruit Growers' Association.

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Agricultural Society, No. 44—President, H. G. Corbett, Lakeville; Secretary, F. K. P. McKenzie, Centreville.

Agricultural Society, No. 51—President, J. M. Donovan, Haymarket Square, St. John; Secretary, R. R. Patchell, Stanley St., St. John.

NOVA SCOTIA.

The Nova Scotia Farmers' Association—Secretary, C. R. Bryan, Truro, N.S.

The Nova Scotia Fruit Growers' Association—Secretary, M. K. Ellis, Port William, N.S.

219, more or less, Agricultural Societies—Supt. F. L. Fuller, Truro, N.S.

12 or more County Farmers' Associations—Supt. F. L. Fuller, Truro, N.S.

The Nova Scotia Poultry Association—Secretary, I. P. Landry, Truro, N.S.

In addition (not receiving government grants), "The United Fruit Companies," composed of 34 co-operated companies in the Annapolis Valley, Secretary, A. E. Adams, Berwick. This company handled 60 per cent. of Nova Scotia's fruit crop last year.

ASSOCIATIONS OF P. E. I.**Farmers' Central Association.**

President, D. N. MacKay, Springfield; R. R. Bradalbane, Secretary, Theodore Ross, Secretary for Agriculture, Charlottetown, P. E. Island.

Horse Breeders' Association.

President, W. W. Crosby, Cornwall; Secretary, the Secretary for Agriculture, Charlottetown.

Dairy Cattle Breeders' Association.

President, Andrew MacRae, East Royalty, R. R. Charlottetown; Secretary, the Secretary for Agriculture, Charlottetown.

Beef Breeders' Association.

President, T. P. Cass, North River; Secretary, the Secretary for Agriculture, Charlottetown.

Sheep Breeders' Association.

President, Henty Boswall, Marshfield; Secretary, the Secretary for Agriculture, Charlottetown.

Swine Breeders' Association.

President, Peter Brodie, York; Secretary, the Secretary for Agriculture, Charlottetown.

BRITISH COLUMBIA.**British Columbia Stock Breeders' Association.**

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British Columbia Dairymen's Association.

H. Rive, Secretary.

British Columbia Poultry Association.

J. R. Terry, Secretary.

British Columbia Fruit Growers' Association.

R. M. Winslow, Secretary.

British Columbia Agricultural Fairs Association.

W. J. Bonavia, Secretary.

British Columbia Central Farmers' Institute.

W. J. Bonavia, Secretary.

(Address Dept. of Agriculture, Victoria, B.C. (for all bodies).)

SASKATCHEWAN.

Saskatchewan Cattle Breeders' Association.

President, R. W. Caswell, Saskatoon; Secretary, J. C. Smith, Regina. **Saskatchewan Sheep Breeders' Association.**

President, Hon. W. C. Sutherland, Saskatoon; Secretary, J. C. Smith, Regina.

Saskatchewan Swine Breeders' Association.

President, F. T. Skinner, Indian Head; Secretary, J. C. Smith, Regina. **Saskatchewan Horse Breeders' Association.**

President, W. H. Bryce, Arcola; Secretary, J. C. Smith, Regina.

Saskatchewan Poultry Association.

President, F. J. Robinson, Regina; Secretary, D. C. McIntyre, Regina.

Saskatchewan Provincial Winter Fair Board.

President, Robert Sinton, Regina; Secretary-Treasurer, J. C. Smith, Regina; Manager, D. T. Elderkin, Regina.

Saskatchewan Provincial Exhibition.

President, J. A. Westman, Regina; Secretary and Manager, D. T. Elderkin, Regina.

Saskatchewan Grain Growers' Association.

President, J. A. Maharg, Moose Jaw; Sec.-Treas., J. B. Musselman, Moose Jaw.

Saskatchewan Hail Insurance Commission.

Chairman, W. C. Paynter, Regina; Sec.-Treas., E. G. Hingley, Regina.

QUEBEC.

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French-Canadian Horse Breeders' Association.

President, Mr. Jos. Deland, L'Acadie; Secretary, Dr. J. A. Couture, Quebec.

Canadian Belgian Draft Horse Breeders' Association.

President, Mr. Paul Tourigny, Victoriaville; Secretary, Mr. J. Arthur Paquet, Department of Agriculture, Quebec City.

French-Canadian Cattle Breeders' Association.

President, Mr. Arsene Denis, St. Norbert Station (Berthier); Secretary, Dr. J. A. Couture, Quebec.

Sheep Breeders' Association of the Province of Quebec.

President, Mr. Nap. Lachapelle, St. Paul l'Ermite, Que.; Secretary, Dr. J. A. Couture, Quebec.

Swine Breeders' Association of the Province of Quebec.

President, Mr. Ls. Lavallee, St. Guillaume, Que.; Secretary, Dr. J. A. Couture, Quebec.

Together with 80 Agricultural Societies.

Agricultural and Live Stock Associations of Alberta.

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Alberta Cattle Breeders' Association.

President, J. L. Walters, Clive; Secretary, E. L. Richardson, Calgary.

Alberta Swine Breeders' Association.

President, Lew Hutchinson, Duhamel; Secretary, E. L. Richardson, Calgary.

Alberta Sheep Breeders' Association.

Secretary, E. L. Richardson, Calgary; President, Bryce Wright, Calgary.

Alberta Winter Fair.

E. L. Richardson, Secretary.

Calgary Industrial Exhibition.

E. L. Richardson, Secretary; E. J. Dewey, Calgary, President.

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Wright, B.S.A., and L. Caesar, B.S.
A.; Prof. of Bacteriology, F. S. Edwards, M.S.; Assistant, D. H. Jones; Secretary and Registrar, S. H. Gaudier, B.S.A.

MacDonald Institute, Guelphs, Ontario.

Director of Home Economics, Miss M. U. Watson; Prof. of Manual Training, John Evans; Instructor in Domestic Science, Miss J. S. Roddick; Lady Supt., Mrs. K. Fuller.

Ontario Agricultural College.

Attendance, 1913.

General Course	609
Specialists in General Course..	9
Manual Training (One Year Normal Course)	5
Teachers' Course—	
Agr. and Hort.	17
Dairy Courses	37
Stock and Seed	189
Poultry Raising	30
Fruit Growing	-04
Apiculture	60

1,060

MacDonald Institute.

Domestic Science	271
Nature Study	78
Elementary Agr. and Hort. ...	44
Woodwork and Mech. Drawing	27
Art and Constructive Work ...	40
Public School Inspectors	229

Total attendance at Guelph. 1,560

MANITOBA AGRICULTURAL COLLEGE.

Winnipeg, Manitoba.

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Macaroon, Grand Champion Clydesdale Stallion, Dominion Exhibition, Brandon, 1913.

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FACULTY OF AGRICULTURE, UNIVERSITY OF SASKATCHEWAN.

Saskatoon, Sask.

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fessor of Poultry Husbandry; W. L. Thompson, Professor of Biology; Archibald Richard Weir, Instructor in English and Mathematics.

NOVA SCOTIA AGRICULTURAL COLLEGE, TRURO, N.S.

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MACDONALD AGRICULTURAL COLLEGE.

St. Anne De Belleville, Que.

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William Lochhead, B.A., M.Sc., Professor of Biology.

Carleton J. Lynde, Ph.D., Professor of Physics.

Leonard, S. Klinck, M.S.A., Professor of Cereal Husbandry.

J. F. Snell, Ph.D., Professor of Chemistry.

H. Barton, B.S.A., Professor of Animal Husbandry.



Grand Champion Wether, Chicago International, 1913. Owned and exhibited by J. & D. J. Campbell, Woodville, Ont.

WINNERS AT PRINCIPAL CANADIAN FAIRS, 1913-14

CLYDESDALES

CLASS.

Aged Stallions	1. Fyvie Baron, Graham Bros.
Stallions, 3 years	1. On Guard, Allison Bros.
Stallions, 2 years	1. Lord Ullin, Graham Bros.
Stallions, 1 year	1. Kirkcudbright, Goodfellow Bros.
Champion	1. Glencaple, Graham Bros.
Brood Mares	1. Rising Hope, Graham Bros.
Yeld Maree	1. Lord Malcolm, Graham Bros.
Filly, 3 years	1. Sir Homer, Allison Bros.
Filly, 2 years	1. Fyvie Baron, Graham Bros.
Filly, 1 year	1. Nellie of Green, Alex. Doherty
Filly, foal	1. Craigeida, Sir H. Pellatt
Champion	1. Mary of Silversprings, T. H. Hassard
	2. Castle Belle, Graham Bros.
	1. Baroness Lee, Graham Bros.
	2. Bonnie Rose, Graham Bros.
	1. Rosie Pride, Graham Bros.
	2. Nell of Aikton, T. H. Hassard
	1. Lady Roger, Graham Bros.
	2. Kelvin Jess, Graham Bros.
	1. W. F. Batt
	2. W. F. Batt
	1. Baroness Lee, Graham Bros.

CLASS.

Aged Stallions	1. Baron Ian, J. Boag & Son
Stallions, 3 years	1. Great Eastern, Smith & Richardson
Stallions, 2 years	1. Prince of Aden, Hassard
Stallions, 1 year	1. Corinthian, Smith & Richardson
Champion	1. Craige Sam, Hassard
	2. Laird o' Ken, Boag
	1. Coming Star, Boag
	2. Thorndale, Smith & Richardson
	Baron Ian

CANADIAN NATIONAL.

1. Fyvie Baron, Graham Bros.	1. Fyvie Baron, Graham Bros.
2. On Guard, Allison Bros.	1. Nellie of Green, Alex. Doherty
1. Lord Ullin, Graham Bros.	2. Craigeida, Sir H. Pellatt
2. Kirkcudbright, Goodfellow Bros.	1. Mary of Silversprings, T. H. Hassard
1. Glencaple, Graham Bros.	2. Castle Belle, Graham Bros.
2. Rising Hope, Graham Bros.	1. Baroness Lee, Graham Bros.
1. Lord Malcolm, Graham Bros.	2. Bonnie Rose, Graham Bros.
2. Sir Homer, Allison Bros.	1. Rosie Pride, Graham Bros.
Fyvie Baron, Graham Bros.	2. Nell of Aikton, T. H. Hassard
Nellie of Green, Alex. Doherty	1. Lady Roger, Graham Bros.
Craigeida, Sir H. Pellatt	2. Kelvin Jess, Graham Bros.
Mary of Silversprings, T. H. Hassard	1. W. F. Batt
Castle Belle, Graham Bros.	2. W. F. Batt
Baroness Lee, Graham Bros.	1. Baroness Lee, Graham Bros.
Bonnie Rose, Graham Bros.	
Rosie Pride, Graham Bros.	
Nell of Aikton, T. H. Hassard	
Lady Roger, Graham Bros.	
Kelvin Jess, Graham Bros.	
W. F. Batt	
W. F. Batt	
Baroness Lee, Graham Bros.	

GUELPH WINTER FAIR.

1. Baron Ian, J. Boag & Son	1. Baron Ian, J. Boag & Son
2. Great Eastern, Smith & Richardson	1. Great Eastern, Smith & Richardson
1. Prince of Aden, Hassard	1. Prince of Aden, Hassard
2. Corinthian, Smith & Richardson	1. Corinthian, Smith & Richardson
1. Craige Sam, Hassard	1. Craige Sam, Hassard
2. Laird o' Ken, Boag	2. Laird o' Ken, Boag
1. Coming Star, Boag	1. Coming Star, Boag
2. Thorndale, Smith & Richardson	2. Thorndale, Smith & Richardson
Baron Ian	Baron Ian

NATIONAL STOCK SHOW.

Fyvie Baron, Graham Bros.	Fyvie Baron, Graham Bros.
Bright Smile, Graham Bros.	Bright Smile, Graham Bros.
Lord Ullin	Lord Ullin
Ryecroft Model, J. M. Gardhouse.	Ryecroft Model, J. M. Gardhouse.
Alert, Graham Bros.	Alert, Graham Bros.
Rising Hope.	Rising Hope.
Lord Malcolm.	Lord Malcolm.
Democrat 2nd, R. Pinkerton.	Democrat 2nd, R. Pinkerton.
Fyvie Baron.	Fyvie Baron.
Castle Belle, Graham Bros.	Castle Belle, Graham Bros.
Bell of Blackhill, R. Beith.	Bell of Blackhill, R. Beith.
Polly of Pineglass, J. Kilgour.	Polly of Pineglass, J. Kilgour.
Nelly McKay, A. Doherty.	Nelly McKay, A. Doherty.
Bessie Faulder, Graham Bros.	Bessie Faulder, Graham Bros.
Snowdrop, H. A. Mason.	Snowdrop, H. A. Mason.
Queen of Kiers, R. Pinkerton.	Queen of Kiers, R. Pinkerton.
Spruce Beauty, J. Fewster.	Spruce Beauty, J. Fewster.

CENTRAL CANADA FAIR, OTTAWA.

Sir Spencer, R. Ness & Son.	Sir Spencer, R. Ness & Son.
On Guard, Allison Bros.	On Guard, Allison Bros.
Corinthian, Smith & Richardson.	Corinthian, Smith & Richardson.
Bladnock, R. Ness & Son.	Bladnock, R. Ness & Son.
Carthy Ideal, Smith & Richardson.	Carthy Ideal, Smith & Richardson.
Clipper Count, R. Ness & Son.	Clipper Count, R. Ness & Son.
Village Swain, Smith & Richardson.	Village Swain, Smith & Richardson.
Sir Homer, Allison Bros.	Sir Homer, Allison Bros.
Sir Spencer.	Sir Spencer.

The Draft Horse of Canada is the **CLYDESDALE**

The experience of yesterday proves this.

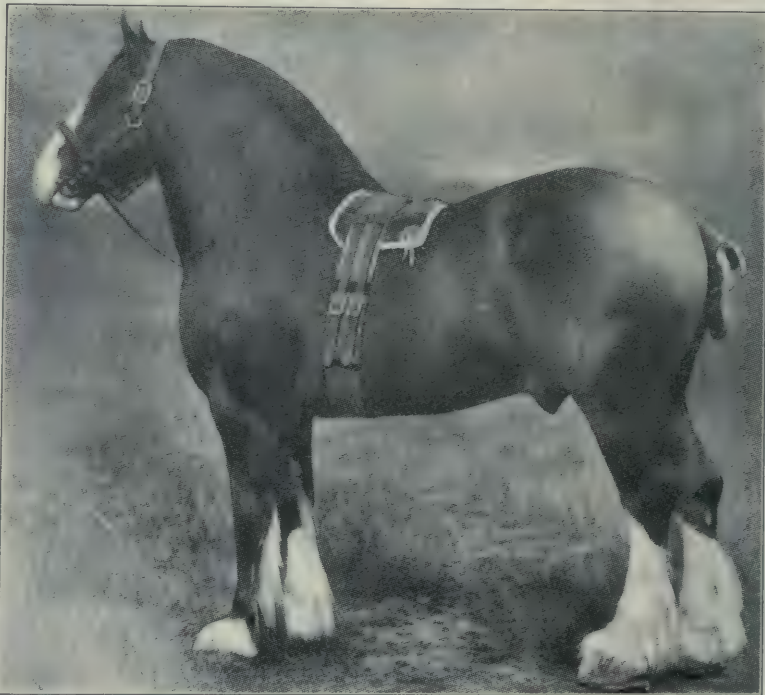
The experience of to-day is added confirmation.

The experience of to-morrow will furnish additional proof

The Clydesdale has been tried out on the farm and in the city and never yet failed to give satisfaction.

The Clydesdale has the staying power, the draught strength and the other qualifications of a real draft horse, which results in his work being done quickly and well.

The foundation stock of the draft type on Canadian farms to-day is Clydesdale. Therefore, it is judicious to cross with the Clydesdale and with no other breed if good draughty type is required.



BARON'S PRIDE (9122) One of the World's Best Draft Horse Sires

If you have a Clydesdale unrecorded that is eligible, have it recorded at once. It will add dollars to its value.

Application Forms will be forwarded by the National Record Office, Ottawa, on application.

The Clydesdale Horse Association of Canada

President, J. A. Boag
Queensville, Ontario

Vice-Pres., Wm. Graham
Claremont, Ontario

Secretary, J. W. Wheaton, 12 Wellington Street East, Toronto



Fyvie Baron, Grand Champion Clydesdale at Canadian National and Chicago International, 1913.

Brood Mares	1. Aged Mare, Lily of Muirton, Hassard	Lady Gold, Adam Scarf.
Yeld Mares	2. Royalette, W. Hogg	Jean Percy, A. Marrow.
Filly, 3 years	1. Princess Patricia, Smith & Richardson	Nan Spencer, R. Ness & Son.
Filly, 2 years	2. Nell of Pendreigh, Boag	Scott's Lady, Allison Bros.
Filly, 1 year	1. Nell of Aikton, Hassard	Lady McTaggart, R. Ness & Son.
Filly, foal	2. Cambobelle, A. Watson	Polly Woodburn, Smith & Richardson.
Champion	1. Pride of the Craig, Boag	Ruby Jen, R. Ness & Son.
Aged Stallions	2. Black Jewel, Smith & Richardson	Smith & Richardson.
Stallions, 3 years	1. Nell of Aikton	Jas. Edson.
Stallions, 2 years	1. Rubio, J. A. Turner	Smith & Richardson.
Stallions, 1 year	2. Charming Prince, J. A. Turner	Lady McTaggart.
Champion	1. Scottish Crown, J. A. Turner	Reserve-Scott's Lady.
Brood Mares	2. Scotland's Tim, A. L. Dollar	EDMONTON (Summer).
Yeld Mares	1. Lord Mersey, J. A. Turner	Royal Shapley, Caswell.
Filly, 3 years	2. King Cole, B. Wright	Baroness Henchman, A. Weir.
Filly, 2 years	1. Pride of Albion, Clark Bros.	Craigie Lad, Clark Bros.
Filly, 1 year	2. Ruby's Crescent, B. Wright	Craigie Blend, Clark Bros.
Champion	1. Scottish Crown	Cumberland Seal, A. Weir.
Brood Mares	2. Lady Bountiful, J. A. Turner	Arnot Middleton, G. H. Cresswell.
Yeld Mares	1. Poppy, J. A. Turner	Prince of Albion, Clark Bros.
Filly, 3 years	2. Ruby Baroness, J. A. Turner	Craigie Lad.
Filly, 2 years	1. Maud McIntyre, B. Wright	Nellie's Queen.
Filly, 1 year	2. Moncton Lassie, J. Turner	Mayoress, Caswell.
Champion	1. Rosie Echo, D. Thorburn	Iron Duchess, C. E. Clark.
Aged Stallions	2. Lady Bountiful	Sheilla of K., A. Weir.
Stallions, 3 years	1. Baron Squire, McFarlane Bros.	Lady Glensman, C. E. Clark.
Stallions, 2 years	2. Baron Belgridan, R. A. Snowball	A. Weir.
	1. Wm. O'Brien	Caswell.
	2. H. W. King	Mayoress.
	1. P. Blanchard	NEW WESTMINSTER.
		Baron Craigie, Capt. Watson.
		Haley's Comet, Jno. Savage.
		King Vivers, Capt. Watson.
		Planet, Shannon Bros.
		Grandview Cedric, Shannon.
		L. Gilmore.

Ormsby Grange Stock Farm

Importer and Breeder of High Class Clydesdales and Shires



Countess of Afton.

1st at Perth in her class; 1st bred by exhibitor, and the Harviestoun Challenge Cup as a two-year-old; 4th at the Highland, Peebles; 3rd at Highland, Aberdeen; 1st at Crieff and Perth as brood mare.

I have on hand at present—5 Clydesdale Mares, 1 Shire Mare, 4 Clydesdale Stallions, 2 Shire Stallions, 8 Clydesdale Fillies, 4 Shire Fillies. Also a number of highly bred foals.

It is my intention to keep adding to this breeding stock from time to time by fresh importations of the best quality and breeding.

Breeders may rely on always finding a large number to select from, both imported and home bred, which they can depend upon and buy at low values.

SEND FOR CATALOGUE.

Duncan McEachran, Proprietor, Ormstown, P.Q.



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Area, 162,000,000 acres

Arable Land, 100,000,000 acres

Under Crop, 3,000,000 acres

Railways in every direction, branching out from the three
Transcontinental roads.



ALBERTA has a splendid CLIMATE both

WHEAT: 68 lbs. to the measured bushel.

HORSES: Alberta is the Kentucky of Canada.

SHEEP: Excellent feed, Good Markets.

For Full Information apply to

Hon. DUNCAN MARSHALL,

(Minister of Agriculture)

EDMONTON, ALBERTA

ALBERTA



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Free Agricultural Schools

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for GRAIN GROWING and MIXED FARMING

SWINE: Alberta's oats and barley equal Indian corn as feed for hogs.

DAIRYING: Alberta produces the best Dairy Cattle in the Western World.

For Full Information apply to

Hon. DUNCAN MARSHALL,

(Minister of Agriculture)

EDMONTON, ALBERTA

Stallions, 1 year	1.	Mignon, Capt. Watson.
Champion	2.	King of Wastham, J. Savage.
Brood Mare	1.	King Vivers.
Yeld Mares	2.	Capt. Watson.
Filly, 3 years	1.	Shannon Bros.
Filly, 2 years	2.	City Lady, J. W. McAllister.
Filly, 1 year	1.	Grandview Lena, Shannon Bros.
Champion	2.	Grandview Dinah, Shannon Bros.
	1.	Iverholm Farm.
	2.	Bramhope Columbine, Mr. Gomery.
	1.	Roseleaf, Capt. Watson.
	2.	Capt. Watson.
	1.	Capt. Watson.
	2.	City Lady.
		SASKATOON (Summer).
	1.	Perpetual Motion, W. C. Sutherland.
	2.	Capt. Todd, W. C. Sutherland.
	1.	Sharon's Pride, Caswell.
	2.	Lowden Bernale, Caswell.
	1.	Dunrobin Favorite, Sutherland.
	2.	Dunrobin Hiawatha, Sutherland.
	1.	Perpetual Motion.
	2.	Capt. Todd.
	1.	Ruby, Sutherland.
	2.	Bayside Beauty, J. McKee.
	1.	Mayoress, Caswell.
	2.	Bonnie Doune, Sutherland.
	1.	Harv's Nell, Sutherland.
	2.	Lady Silverdon, Sutherland.
	1.	Jennie Lee.
	2.	R. W. Caswell.
	1.	R. W. Caswell.
	2.	McKay.
	1.	Mayoress.
	2.	Bonnie Doune.
		BRANDON.
	1.	Macaroon, Hassard.
	2.	Prince, R. McLean.
	1.	Prince of Eden, Hassard.
	2.	Black Ivory, T. Jasper.
	1.	Charnock, A. Galbraith.
	2.	D. L. Revelanta, B. Wright.
	1.	Royal Astoria, W. McCallum.
	2.	Happy Concord, W. Barker.
	1.	Macaroon.
	2.	Charnock.
	1.	Royal Beauty, N. Reburn.
	2.	Winsome Nell, W. R. Barker.
	1.	Mary of Silversprings, Hassard.
	2.	Amy of Darling, Caswell.
	1.	Elona, Grant.
	2.	Lady Hopetown, Grant.
	1.	Countess of Murray, Bryce.
	2.	D. L. Florodora, Bryce.
	1.	Scottish Princess, McCallum.
	2.	Hager's Queen, W. Grant.
	1.	Mary of Silversprings.
	2.	Countess of Murray.
		CLASS.
Aged Stallions	1.	Macaroon, Hassard.
Stallions, 3 years	2.	Prince, R. McLean.
Stallions, 2 years	1.	Prince of Eden, Hassard.
Stallions, 1 year	2.	Black Ivory, T. Jasper.
Champion	1.	Charnock, A. Galbraith.
	2.	D. L. Revelanta, B. Wright.
	1.	Royal Astoria, W. McCallum.
	2.	Happy Concord, W. Barker.
	1.	Macaroon.
	2.	Charnock.
	1.	Royal Beauty, N. Reburn.
	2.	Winsome Nell, W. R. Barker.
	1.	Mary of Silversprings, Hassard.
	2.	Amy of Darling, Caswell.
	1.	Elona, Grant.
	2.	Lady Hopetown, Grant.
	1.	Countess of Murray, Bryce.
	2.	D. L. Florodora, Bryce.
	1.	Scottish Princess, McCallum.
	2.	Hager's Queen, W. Grant.
	1.	Mary of Silversprings.
	2.	Countess of Murray.

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COQUITLAM, B.C.

The Most Modern Farm in Canada

Clydesdales

The best quality of foundation stock Imported
and Canadian Bred.

Shires

These are by the highest quality of breeding
and individual merit.

Hackneys

Style and type that have never been excelled.

Holsteins

With highest official records in Canada.

***TUBERCULIN TESTED TWICE EVERY YEAR
BREED THE BEST AND MAKE THEM BETTER***

British Columbia the land of prosperity

Make us a visit

Dr. C. E. Doherty, Manager - Coquitlam, B.C.

Filly, 1 year	1. Scottish Princess, McCallum	Hillcrest P. Pat., Taber.
	2. Diamond Queen, W. Grant	Revelanta D., Bryce.
Filly, foal	1. A. Graham	
	2. A. Graham	
Champion	Lady Hopetown	Countess of Moray.
Reserve		Mayoress.
OTTAWA.		
Aged Stallions	1. King of Fountain Pk.	Smith & Richardson.
	2. Koyama	D. G. Boyd.
Stallions, 2 years	1. Gallant Baron	Adam Scarf.
	2. Mazappe	B. Rothwell.
Stallions, 1 year	1. Glen Ivory	Smith & Richardson.
	2. Prince Hero	Allison Bros.
Champion	Glen Ivory	Smith & Richardson.
Filly, 3 years	1.	Smith & Richardson.
Filly, 2 years	1.	Smith & Richardson.
	2.	Geo. Watson.
Filly, 1 year	1.	Allison Bros.
	2.	N. G. Vallequette.

Canadian Bred Clydesdales

CANADIAN NATIONAL EXHIBITION.

CLASS.

Aged Stallions	1. Baron Dalmeny	Graham Bros.
	2. Lord Ronald	McMichael.
Stallions, 2 years	1. Maconbie	Graham Bros.
	2. Monteith Again	Geo. Bell.
Stallions, 1 year	1. Lockwood Chief	J. Johnston.
	2. Acme's Best	J. Rennie.
Champion	Baron Dalmeny	Graham Bros.
Brood Mare	1. Nelly	A. Bladock.
	2. Princess Glendrie	McMichael.
Filly, 3 years	1. Belle Ivory	W. Pollock.
	2. Mossy Rose	G. Dale.
Filly, 2 years	1. Hillside Bessie	H. I. Barnhardt.
	2. Bonnie	J. M. Gardhouse.
Filly, 1 year	1. Queen of N. B.	W. J. Howard.
	2. Kate B.	P. W. Boynton.
Champion	Belle Ivory	

Dunrobin Stock Farm

Saskatoon, Sask.

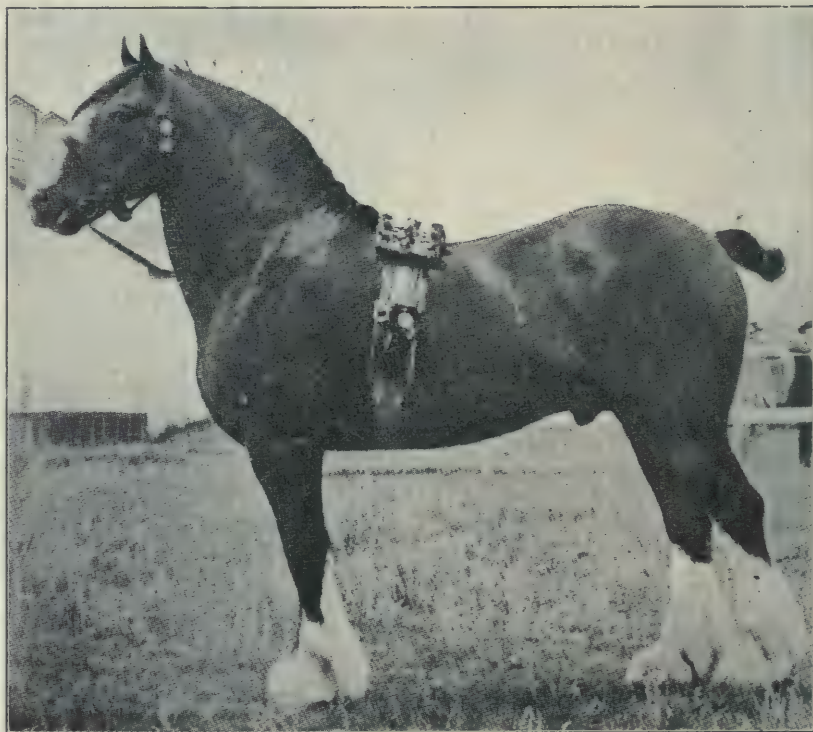
Clydesdale Horses

Shorthorn Cattle

Shropshire Sheep

Yorkshire Swine

Leaders In Their Classes



Perpetual Motion, Imp. (5473) Sire, Hiawatha, at the Head of the Stud

In selecting our foundation stock, we were careful, and chose only perfect types, with the best of breeding procurable. The result of these selections and perfect mating can be seen to-day, by the choice young things that stock the Dunrobin Farm to-day.

You should visit the farm, or write for further particulars, to

W. C. Sutherland, Prop., Saskatoon, Sask.

CLASS.

NATIONAL SHOW, TORONTO.

Aged Stallions	1. Baron Elator	Staples & Sons.
	2. Dandy Prince	Rogers.
Stallions, 2 years	1. Maconbie	Graham Bros.
	2. Kier Jimmie	R. B. Pinkerton.
Stallions, 1 year	1. Prince Fashion	J. Laurie.
	2. Lockwood Chief	J. Johnston.
Stallions, Foal	1. Prince Carruchan 2nd	W. F. Batt.
	2. Kier Quality	Pinkerton.
Champion	Baron Elator	Staples & Sons.
Aged Mares	1. Derwent Queen	Staples & Sons.
	2. Royal Rose	Industrial Farm.
Filly, 3 years	1. Dolly Muray	Mr. Fisher.
	2. Boulard Queen	J. Leonard.
Filly, 2 years	1. Bonnie	J. M. Gardhouse.
	2. Hillside Bessie	H. I. Barnhardt.
Filly, 1 year	1. Avenue Bill	W. F. Batt.
	2. Miss Rhona	A. Jamieson.
Filly, Foal	1. Princess Carruchan 2nd	Batt.
	2. Ruby Lane	F. J. Willson.
Champion	Dolly Muray	Mr. Fisher.

CLASS.

DOMINION, BRANDON.

Aged Stallions	1. Prince Robert	Hugh McLean.
	2. Sir Francis Drake	A. McPhail.
Stallions, 3 years	1. Watalanta's Heir	John Shield.
	2. Baron Ivory	Thos. Jasper.
Stallions, 2 years	1. Bobbie Concord	John Scharff.
	2. Cairndale Lad	W. & H. Jackson.
Stallions, 1 year	1. Royal Ivory	John Nicol.
	2. Happy Concord	W. A. Barkey.
Champion	Prince Robert	McLean.
Filly, 3 years	1. Carmen Vic.	John Wood.
	2. Auro Belle	Wm. Grant.
Filly, 2 years	1. Doune Lodge Floradora	W. H. Bryce.
	2. Jean McPhail	McPhail.
Filly, 1 year	1. Hagers Queen	Grant.
	2. Rivelanta's Duchess	Bryce.
Champion	Carmen Vic.	John Wood.

CLASS.

GUELPH.

Aged Stallions	1. Dandy Prince	K. C. Rogers.
Stallions, 2 years	2. Baron Elator	J. F. Staples.
Stallions, 1 year	1. Royal Netherlee	Dickson Bros.
Champion	2. Donald Glamis	G. Gropp.
Aged Mares	1. Glen Ivory	Smith & Richardson.
Filly, 3 years	2. Richhill Baron	J. B. Barnhardt.
Filly, 2 years	1. Glen Ivory	Smith & Richardson.
Filly, 1 year	1. Charming Jean	I. E. Haug.
Filly, Foal	2. May Morn, 2nd	J. Black.
Champion	1. Queen of Tuam	H. Hastings.
	2. Lady Favorite	J. D. Campbell.
	1. Hillside Bessie	H. I. Barnhardt.
	2. Princess McQueen	J. Bowes.
	1. Hillside Beauty	H. I. Barnhardt.
	2. Pat. of Connaught	Peter Christie.
	1. Princess Carruchan 2nd	W. F. Batt.
	2. Scotland Charm	G. Miller.
	Princess Carruchan 2nd	W. F. Batt.

CLASS.

LONDON.

Aged Stallions	1. Lord Ronald	Thos. McMichael.
Stallions, 2 years	2. Glen Rae	Thos. McMichael.
Stallions, 1 year	1. Attwood	Dickson Bros.
Champion	2. St. Columbus	J. Carlin.
Filly, 3 years	1. Doc. Livingston	McMichael.
Filly, 2 years	2. Jimmy Reid	McMichael.
Filly, 1 year	Lord Ronald	A. Dale.
Filly, Foal	1. Mossy Rose	Tierheller Bros.
	2. Princess of Fern	McMichael.
	1. Rosie	W. Rinn.
	2. Miss Glen Rae	G. Cornish.
	1.	Dickson Bros.
	2.	McMichael.
	1.	Dickson Bros.
	2.	

CLASS.

REGINA.

Aged Stallions	1. Prince Robert	Hugh McLean.
	2. Laboria Agan	Logan & Robertson.

Percherons

Are now recognized as the best draft horse for Canada. Why?

Because

They will haul as big a load and do as much work as any other draft breed.

They will haul the big load and trot home.

They have splendid constitutions, are easily kept and have kind dispositions.

They are active as cats and yet have the weight and draft quality.

Breed to Percherons, and buy a team of pure bred mares. They will be money makers, and help keep the boy on the farm, as all boys love good stock.

If you want information about Percherons, apply to

The Canadian Percheron Horse Breeders' Association

GEORGE LANE, President.

J. C. DREWRY, Vice-President.

F. R. PIKE, Secretary, Pekisko, Alberta.

T. H. HASSARD

IMPORTER and BREEDER of

Clydesdales and Percherons

CHAMPIONS OF BOTH BREEDS

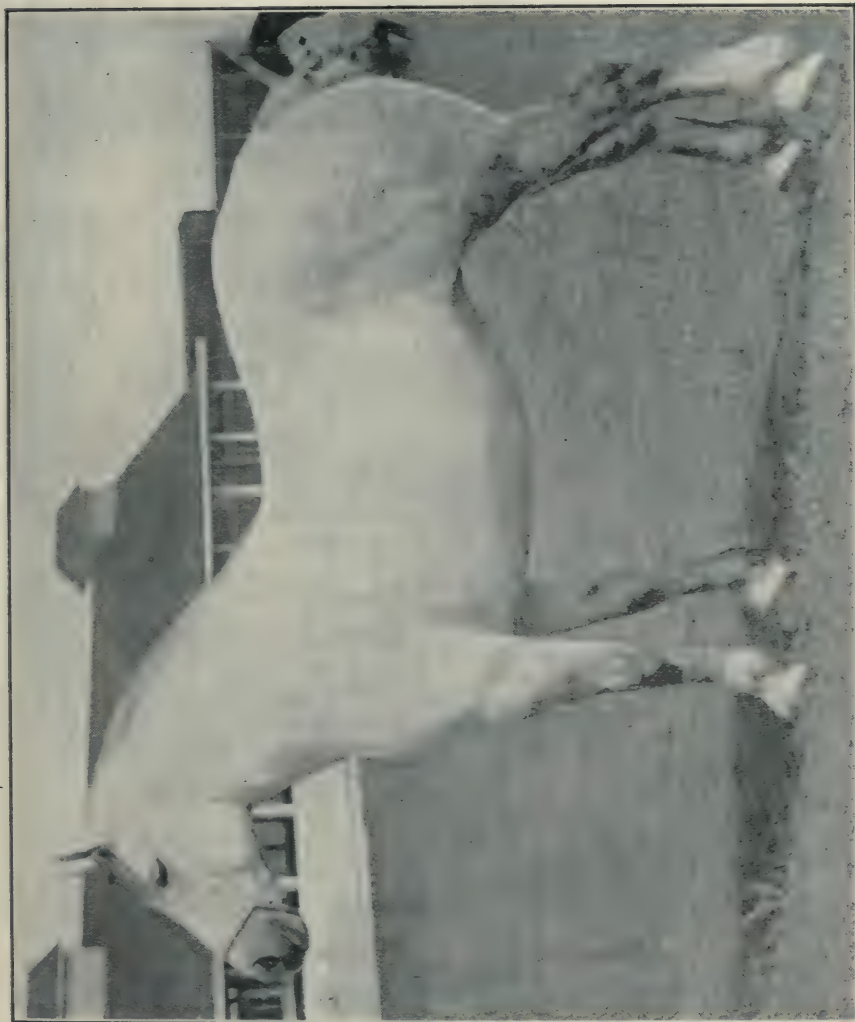
Our 1913 winnings were unequalled in Canada. We import more horses than any one firm in Canada. Size, quality and breeding are equal considerations. You are always sure of a good selection of both breeds at the Markham stables.

Write for particulars, or better still, make us a visit

Shipping Stations, Markham, G.T.R., Locust Hill, C.P.R.

T. H. HASSARD - MARKHAM, ONT.

Stallions, 3 years	1. Bit of Fashion	H. Gilmore.
Stallions, 2 years	1. Montravs Millne	T. Clark.
	2. Sharons Pride	R. W. Caswell.
Stallions, 1 year	1. Hillcrest Favorite	Alex. Mutch.
	2. Rivelanta Agan	W. H. Bryce.
Champion	Prince Robert	McLean.
Brood Mare	1. Baron Lassie	R. Taber.
	2. Easter Kate	Jos. Hagarty.
Filly, 3 years	1. Nellie Lansdown	Wm. Grant.
	2. Queen Hiawatha	Hagarty.
Filly, 2 years	1. Doune Lodge Floradora	W. H. Bryce.
	2. Royal May	Wm. Grant.
Filly, 1 year	1. Hillcrest P. Pat.	R. Taber.
	2. Doune Lodge Rivelanta	W. H. Bryce.
Champion	Doune Lodge Floradora	Bryce.
CLASS.		
Aged Stallions	1. Ichnobate, Hodgkinson & Tisdale	
Stallions, 3 years	1. Imola, J. B. Hogate	
	2. Kiff-Kiff, T. H. Hassard	
Stallions, 2 year	2. Kilo, Hodgkinson & Tisdale	
	1. Liquite, T. H. Hassard	
Stallions, 1 year	2. Lacis, Hodgkinson & Tisdale	
Champion	1. Malitor, Hodgkinson & Tisdale	
Brood Mare	1. Ichnobate	
	2. Julia, Wm. Pears	
	2. Farinette, J. Haines	
Aged Mare	1. Icaque, Hodgkinson & Tisdale	
Yeld Mare	2. Jaenne, Sir H. Pellatt	
Filly, 3 years	1. Kanaille, Hodgkinson & Tisdale	
Filly, 2 years	2. Kamarilla, T. H. Hassard	
	1. Lahurviniere, T. H. Hassard	
	2. License, Hodgkinson & Tisdale	
Filly, 1 year	1. Lady Leonia, Wm. Pears	
	2. Marguerite, Hodgkinson & Tisdale	
Filly, Foal	1. Wm. Pears	
	2. Mrs. Haines	
Champion	Kanaille	
Percherons		
CANADIAN NATIONAL.		
	1. Ichnobate, Hodgkinson & Tisdale	
	2. Imola, J. B. Hogate	
	2. Kilo, Hodgkinson & Tisdale	
	1. Liquite, T. H. Hassard	
	2. Lacis, Hodgkinson & Tisdale	
	1. Malitor, Hodgkinson & Tisdale	
	1. Ichnobate	
	2. Julia, Wm. Pears	
	2. Farinette, J. Haines	
	1. Icaque, Hodgkinson & Tisdale	
	2. Jaenne, Sir H. Pellatt	
	1. Kanaille, Hodgkinson & Tisdale	
	2. Kamarilla, T. H. Hassard	
	1. Lahurviniere, T. H. Hassard	
	2. License, Hodgkinson & Tisdale	
	1. Lady Leonia, Wm. Pears	
	2. Marguerite, Hodgkinson & Tisdale	
	1. Wm. Pears	
	2. Mrs. Haines	
	Kanaille	
NATIONAL STOCK SHOW.		
	Jet, Steen & Cheyney.	
	Jablor, J. B. Hogate.	
	Kirlogeden, J. B. Hogate.	
	Kirsch, J. B. Hogate.	
	Lampyre, T. D. Elliott.	
	Lassis, T. D. Elliott.	
	Herculaid, G. Boulter.	
	Lampyre.	
	Kolonaille, J. B. Hogate.	
	Jactation, W. Henry & Son.	
	Jeanette, W. Henry & Son.	
	Simac, T. D. Elliott.	
	Lisa, J. B. Hogate.	
	Jactation.	



Flossy, Champion Percheron Female, Dominion Fair, Brandon, 1913. Owned and exhibited by J. C. Drewry, Cowley, Alta.

CLASS.

ONTARIO, PROVINCIAL.		OTTAWA.		HALIFAX.	
Aged Stallions	1. Irade, T. D. Elliott	Iniola, J. B. Hogate	Gresham, H. C. Jewett.	J. R. Collie.	
	2. Jet, Cheyney & Steen	Junior, R. Hamilton & Son			
Stallions, 3 years . .	1. Kiff-Kiff, Hassard	Jack, R. Hamilton & Son			
	2. Karcan, R. Hamilton	Kamos, J. E. Arnold			
Stallions, 2 years . .	1. Lampyre, Elliott	J. B. Hogate			
	2. Laricat, Hassard	J. E. Arnold			
Champion	Lampyre		Gresham.		
Filly, 3 years	1. Maline, Elliott	J. E. Arnold	W. McManus.		
Filly, 2 years	1. Juvenite, Hassard	J. E. Arnold	A. Fleming.		
	(Mares Any Age)				
Filly, 1 year	1.	J. E. Arnold	A. Fleming.		
Foals	1.		A. Fleming.		
	2.		A. Fleming.		
Brood Mares	1.		W. Symes.		
	2.		Fleming's Brood Mare.		
Champion			Fleming's Brood Mare.		
WINNIPEG (Summer).		REGINA (Summer).			
Aged Stallions	1. Jureur, J. C. Drewry	Jureur, J. C. Drewry			
	2. Garon, Alex. Galbraith	J. W. McInnis			
Stallions, 3 years . .	1. Pontiac, J. C. Drewry	Pontiac, J. C. Drewry			
	2. Rambler, Finch Bros.	Paramount, R. B. Moore			
Stallions, 2 years . .	1. Nolan, J. C. Drewry	Nolan, J. C. Drewry			
	2. Hercules, Alex. Gallraith	Stampede, Upper Bros.			
Stallions, 1 year . . .	1. Wilson, Finch Bros.	Roland, R. B. Moore			
	2. Futurity, Upper Bros.				
Champion	Jureur	Jureur			
Reserve	Garon	Roland			
Brood Mares	1. Myra, Alex. Reid	Quickstep, Upper Bros.			
	2. Eveline, Upper Bros.	Evelyn, Upper Bros.			
Yeld Mare	1. Flossie, J. C. Drewry	Flossie, J. C. Drewry			
	2. Rosine, Upper Bros.	Pauline, Upper Bros.			
Filly, 3 years	1. Marlowette, C. D. Roberts	E. Pootman & Sons			
	2. Russellette, C. D. Roberts				
Filly, 2 years	1. Rosette, J. C. Drewry	Abeline, Upper Bros.			
	2. Empretto, J. C. Drewry	Rosette, J. C. Drewry			
Filly, 1 year	1. Glenette, J. C. Drewry	Gloriana, J. C. Drewry			
	2. Industrious, Geo. Lane	Glenette, J. C. Drewry			
Champion	Flossie	Flossie			
Reserve	Rosette	Abeline			

The Glen Ranch Percherons

have an established reputation

In 1913, a carload (11 head) of my Percherons were exhibited at Calgary, Lethbridge, Macleod, Winnipeg, Brandon (Dominion Exhibition) and Regina, winning the following prizes :

91 First Prizes,

43 Second Prizes,

15 Third Prizes,

7 Fourth Prizes,

27 Gold Medals,

10 Silver Medals,

21 Silver Cups and Shields,

50 Championships (Individual and Groups),

25 Reserve Championships.

And at every exhibition winning the Gold Medals for the best five stallions.

It pays to breed the best.

The Glen Ranch is the home of Jureur, Flossy, Habitus, Empreto, Rosette, Glorianna, Glennette, and many others with an International reputation.

Over 40 Percherons to select from.

If you want to buy the "Right Kind," visit

The Glen Ranch
J. C. Drewry, Prop.
Cowley, Alberta

CLASS.

DOMINION, BRANDON.

CALGARY (Summer).

Aged Stallions	1. Jureur, J. C. Drewry	Igome, J. Manson.
Stallions, 3 years	2. Garon, A. Gallraith	J. C. Groat.
Stallions, 2 years	1. Pontiac, J. C. Drewry	Acme, A. E. Davenport (lone entry)
Stallions, 1 year	2. Kiff-Kiff, T. H. Hassard	No entries.
Champion	1. Nolan, J. C. Drewry	A. E. Davenport had only entry.
Reserve	2. Laniat, T. H. Hassard	Acme.
Brood Mares	1. Futurity, Upper Bros.	Jasino, A. E. Davenport.
Yeld Mares	2. King George V., G. Lane	J. Manson.
Filly, 3 years	Jureur	
Filly, 2 years	Evelyne, Upper Bros.	
Filly, 1 year	1. Flossie, Drewry	
Champion	2. Rosine, Upper Bros.	
Reserve	1. Kokarde, Hassard	
Brood Mares	2. Harvala, Jasper	
Yeld Mares	1. Abeline, Upper Bros.	
Filly, 3 years	2. Labenbiniere, Hassard	
Filly, 2 years	1. Gladys, W. Forrest	Davenport.
Filly, 1 year	2. Glorianna, Drewry	J. Manson.
Champion	Flossie, Drewry	Jasino.
Reserve	Evelyne, Upper Bros.	

CLASS.

LONDON, WESTERN.

EDMONTON (Summer).

SASKATOON.

Aged Stallions	1. Javaille, Hodgkinson & Tisdale.	Igome, J. Manson	Morse, W. C. Henderson.
Stallions, 3 years	2. Sullivan.	J. C. Groat	Hermans.
Stallions, 2 years	1. Kiff-Kiff, T. H. Hassard	Acme, A. E. Davenport	
Stallions, 1 year	2. Kathorne, Guest & Wilkinson.	(Lone Entry.)	
Champion	1. Labour, Hodgkinson & Tisdale	No Entries	Other classes not filled.
Brood Mares	2. Lacs, Hodgkinson & Tisdale	A. E. Davenport had only Entry	
Filly, 3 years	1. Javaille	Acme	
Filly, 2 years	2. J. Guest	Jasino, A. E. Davenport	
Stallions, 3 years	1. Kokarde, T. H. Hassard.	J. Manson.	
Stallions, 2 years	2. Kaville, Hodgkinson & Tisdale		
Stallions, 1 year	1. Labenbiniere, Hassard		
Champion	2. Hodgkinson & Tisdale		

Maple Leaf Stock and Fruit Farm

IMPORTERS AND BREEDERS OF
English Shire Horses

AND
Shorthorn Cattle

PACKERS OF
Ontario's Best Small Fruits

Shipping Stations: G.T.R., Burlington Junction,
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Porter Bros. Appleby, Ont.

Mount Victoria Stock Farm

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T. B. Macaulay, Prop.

E. Watson, Mgr.



**Clydesdale
Hackney,
HORSES**

**Shetland and
Hackney
PONIES**

Imported and Canadian Bred

The most fashionable strains
of each breed. Prize winners
in their individual classes. Al-
ways a good selection on hand.

Christopher North, Imp. Sire, Polonius, Champion at Ottawa, 1913

Come and see them



Sittyton Lady 3rd, Champion Shorthorn Female, Brandon and Winnipeg, 1913.

Aged Cows	1.	Rosabella, C. A. Archibald.
Heifers, 3 years	2.	W. B. Queen, I. Lovett.
Heifers, 2 years	1.	R. A. Snowball.
Heifers, 1 year	2.	C. A. Archibald.
Heifers, Sr. Calf	1. Golden Drop 19th, Kyle Bros.	R. A. Snowball.
Heifers, Jr. Calf	2. Maid Fancy 3rd, Nicholson	I. Lovett.
Champion	1. Marr Fanny, Nicholson	C. A. Archibald.
Aged Herd	2. Lady of Vanity, Kyle Bros.	C. A. Archibald.
Junior Herd	1.	Rosabella.
	2. Golden Drop 19th	R. A. Snowball.
	1. Kyle Bros.	R. A. Snowball.
	2. R. S. Nicholson	
	1. Kyle Bros.	
	2. R. S. Nicholson	
CLASS.		
Aged Bulls	1. Gainford Marquis, R. W. Caswell	LONDON WESTERN.
Bulls, 2 years	2. Sultan Stamp, Anoka Farm	White Raphael, Mitchell Bros.
Bulls, Sr. yearlings	1. Missie's Prince, H. L. Emmert	Browndale Sultan, H. L. Emmert.
Bulls, Jr. yearlings	2. Choice Goods, H. L. Emmert	Missie's Prince, H. L. Emmert.
Bulls, Sr. Calf	1. Sittytion Selection, Emmert	Right Sort, Mitchell Bros.
Bulls, Jr. Calf	2. Oak Bluffwander, Emmert	Royalist, Emmert.
Champion	1. Royalist, Emmert	Bandman Victory, Mitchell Bros.
Reserve	2. Margrave Gloster, Emmert	H. L. Emmert.
Aged Cows	1. Fond Lavender, Anoka Farm	Mitchell Bros.
Heifers, 2 years	2. Banner Bearer, Emmert	J. A. Watt.
Heifers, Sr. yearlings	1. Sultan Marshall, Caswell	Mitchell Bros.
Heifers, Jr. yearlings	2. Gainford Marquis	White Raphael.
Heifers, Sr. Calf	1. Missie's Prince	Fair Start 2nd, Emmert.
Heifers, Jr. Calf	2. Fair Start 2nd, Emmert	Queen Mildred, Mitchell Bros.
Champion	1. Dales Gift, Caswell	Jealousy 4th, J. A. Watt.
Reserve	2. Duchess of Gloster 78, Emmert	Thelma 2nd, Emmert.
Aged Cows	1. Thelma 2nd, Emmert	Duchess of Oak Bluff 2nd, Emmert.
Heifers, 2 years	2. Burnbrae Wimple, Caswell	Maxwalton Beauty, Mitchell Bros.
Heifers, Sr. yearlings	1. Duchess of Oak Bluff 2nd, Emmert	Sittytion Rosebud, Emmert.
Heifers, Jr. yearlings	2. Emmert	Sittytion Lady 3rd, Emmert.
Heifers, Sr. Calf	1. Emmert	Emmert.
	2. Emmert	J. A. Watt.

Heifers, Jr. Calf	1. Emmert	Emmert.
Grand Championship	2. Emmert	Mitchell Bros.
Reserve	Sittytion Lady 3rd	Fair Start 2nd.
Aged Herd	Duchess of Gloster	
	1. Emmert	Emmert.
	2. Caswell	Mitchell Bros.
Junior Herd	1. Emmert	Emmert.
	2. Anoka Farm	J. A. Watt.
CLASS.		
DOMINION BRANDON.		
Aged Bulls	1. Gainford Marquis, R. W. Caswell	
Bulls, 2 years	2. Sultan Stamp, Anoka Farms	
	1. Choice Goods, Emmert	
	2. Missie's Prince, Emmert	
Bulls, 1 year	1. Sittytion's Selection, Emmert	
	2. Red Jim, Emmert	
Bulls, Jr. yearlings	1. Royalist, Emmert	
	2. Poplar Park, Joe English	
Bulls, Calf Sr.	1. Margrove Gloster, Emmert	
	2. Gainford of Saskatoon, Caswell	
Bulls Calf, Jr.	1. Banner Bearer, Emmert	
	2. Oak Bluff Knight, Emmert	
Grand champion	Gainford Marquis	
Reserve	Banner Bearer	
Aged Cows	1. Fair Start 2nd, Emmert	
	2. Dales Gift, Caswell	
Heifers, 2 years	1. Duchess of Gloster, Emmert	
	2. Thelma 2nd, Emmert	
Heifers, Sr. yearlings	1. Duchess of Oak Bluff, Emmert	
	2. Burnbrae Wimple, Emmert	
Heifers, Jr. yearlings	1. Sittytion Lady 3rd, Emmert	
	2. Sittytion Rosebud, Emmert	
Senior Calf	1. Duchess of Oak Bluff 2nd, Emmert	
	2. Violet Lucille, Emmert	
Junior Calf	1. Sultan's Queen, Caswell	
Grand Champion	2. Wry Queen, Caswell	
Female	1. Sittytion Lady 3rd	
	2. Fair Start 2nd	
EDMONTON (Summer).		
	Gainford Marquis, Caswell.	
	Browndale Sultan, H. L. Emmert.	
	Missie's Prince, Emmert.	
	Choice Goods, Emmert.	
	Sittytion's Selection, Emmert.	
	Only entry.	
	Margrove Gloster, Emmert.	
	Marquis of Saskatoon, Caswell.	
	Gainford Marquis.	
	Fair Start 2nd, Emmert.	
	Dales Gift, Caswell.	
	Thelma 2nd, Emmert.	
	Duchess of Gloster, Emmert.	
	Burnbrae Wimple, Emmert.	
	Duchess of Oak Bluff, Emmert.	
	Sittytion Lady 3rd, Emmert.	
	Sittytion Rosebud, Emmert.	
	Duchess of Oak Bluff 2nd, Emmert.	
	Violet Lucille, Emmert.	
	Fair Start 2nd.	

Senior Herd	1. Emmert	Emmert.
Junior Herd	2. Caswell	Caswell.
	1. Emmert	Emmert.
	2. Caswell	Caswell.
	CANADIAN NATIONAL.	
Aged Bulls	1. Missie Marquis, F. W. Smith	
Bulls, 2 years	2. Browndale Sultan, H. L. Emmert	
	1. Missie's Prince, Emmert	
	2. Right Sort, Mitchell Bros.	
Bulls, Sr. yearlings	1. Meadow Signet, G. Amos	
	2. Count Omega, Leslie & Pearson	
	1. Royalist, Emmert	
	2. Matchless Hero, Geo. Gier	
	2. Broodhook's Star, Kyle Bros.	
Bulls, Sr. Calf	1. Sittytion Favorite, Kerr & Davidson	
	2. Gainford Perfection, J. A. Watt	
	Missie Marquis	
Champion	Matchless Hero	
Jr. Champion	Fair Start 2nd, Emmert	
Aged Cows	Queen Mildred, Mitchell Bros.	
Heifers, 2 years	1. Theima 2nd, Emmert	
	2. Jealousy 4th, J. A. Watt	
Heifers, Sr. yearlings	1. Duchess of O. B., Emmert	
	2. Cecilia, Jno. Gardhouse	
Heifers, Jr. yearlings	1. Sittytion Lady 3rd, Emmert	
	2. Sittytion Rosebud, Emmert	
Heifers, Sr. Calf	1. Duchess of O. B. 3rd, Emmert	
	2. Silver Queen, J. A. Watt	
Heifers, Jr. Calf	1. Ury's Queen, Emmert	
	2. Orange Flower, A. F. & G. Auld	
Champion	Fair Start 2nd	
Reserve	Sittytion Lady 3rd	
Jr. Champion		
	NATIONAL SHOW.	
	Craigalachie, Carpenter & Ross.	
	Sultan Stamp, Anoka Farm.	
	Gloster Fashion, Anoka Farm.	
	Right Sort, Mitchell Bros.	
	Maxwalton Renown, Carpenter & Ross.	
	Meadow Signet, G. Amos.	
	Nero of Cluny, Mitchell Bros.	
	Longfellow, R. Millers.	
	Matchless Hero, Geo. Gier.	
	Royal Silver, Anoka Farm.	
	Sittytion Favorite, Kerr & Davidson.	
	Gainford Perfection, Watt.	
	Gloster Fashion.	
	Maxwalton Renown.	
	Queen Mildred, Mitchell Bros.	
	Maxwalton Gloster 3, Carpenter & Ross	
	Maxwalton Murine, Anoka Farm.	
	Jealousy 4th, J. A. Watt.	
	Maxwalton Rosebud, Carpenter & Ross	
	Fancy Mine, Anoka Farm.	
	Village Flower 2nd, Anoka Farm.	
	Nonpareil 4th, A. F. & G. Auld.	
	J. A. Watt.	
	Carpenter & Ross.	
	Kerr & Davidson.	
	Carpenter & Ross	
	Maxwalton Murine.	
	Maxwalton Rosebud.	

Aberdeen Angus**EDMONTON (Summer).**

1. E. P. Wizard, J. Bowman
2. Glencarnock King, Lew Hutchinson

CLASS.

Aged Bulls

DOMINION, BRANDON.

E. P. Wizard, J. Bowman.

Bulls, 2 years	1. Beauty's Prince, Bowman	B. of Harviestoun, J. D. McGregor.
Bulls, Sr. yearlings	2. B. of Harviestoun, McGregor	Beauty's Prince, Bowman.
Bulls, Jr. yearlings	1. Beauty's Erwin, Bowman	Beauty's Erwin, Bowman.
	1. E. P. Mailbag, Bowman	E. P. Mailbag, Bowman.
	2. Thaddeus, Hutchinson	
Bulls, Sr. Calf	1. McGregor	Evectates Prince, McGregor.
	2. McGregor	Glencarnock Ensign, McGregor.
Bulls, Jr. Calf	1. Bowman	McGregor.
	2. Hutchinson	Bowman.
Grand Champion	E. P. Wizard	Boreaux Harviestoun.
Reserve	Beauty's Prince	E. P. Wizard.
Aged Cows	1. Pride of Cherokee, McGregor	Queen Rose, McGregor.
	2. E. P. Beauty, Bowman	Pride of Choice 19, McGregor.
Heifers, 2 years	1. Queen M. of Glencarnock, McGregor ..	Eriford, McGregor.
	2. Eriford, McGregor	Queen M. of Glencarnock, McGregor.
Heifers, Sr. yearlings	1. E. P. Pride 12, Bowman	McGregor.
	2. B. Rose of Glencarnock, McGregor ..	Bowman.
Heifers, Jr. Yearlings	1. E. P. Rosebud, Bowman	McGregor.
	2. E. P. Keepsake, Bowman	Bowman.
Heifers, Sr. Calf	1. McGregor	McGregor.
	2. Bowman	McGregor.
Heifers, Jr. Calf	1. McGregor	McGregor.
	2. Bowman	McGregor.
Grand Champion	Pride of Cherokee	Eriford.
Reserve	Queen Mother of Glencarnock	
Aged Herd	1.	McGregor.
	2.	Bowman.
	1.	McGregor.
	2.	Bowman.
Junior Herd	1.	
	2.	

Herefords

CLASS.		WINNIPEG (Summer).	REGINA (Summer).
Aged Bulls	1. E. P. Wizard, J. Bowman	E. P. Wizard, J. Bowman.	
Bulls, 2 years	1. Beauty's Prince, Bowman	Beauty's Prince, Bowman.	
	1. Evereux H., McGregor	E. of Harviestoun, J. D. McGregor.	
Bulls, 1 year	1. Beauty's Erwin, Bowman	Beauty's Erwin, Bowman.	
Bulls, Jr. yearlings	1. E. P. Mailbag, Bowman		
Bulls, Sr. Calf	1. McGregor		
	2. McGregor		

[illegible]

Heifer, Sr. yearlings	1. Miss Brae 40, Clifford	Miss Brae 40, Clifford.
	2. Fair Vic, Chapman	Fair Vic, Chapman.
Heifer, Jr. yearlings	1. Chapman	Fleta Fairfax, Clifford.
	2. Chapman	Miss A. Fairfax, Chapman.
Heifer, Sr. Calf	1. Clifford	Clifford.
	2. Chapman	Chapman.
Heifer, Jr. Calf	1. Clifford	Clifford.
	2. M. Boyd	M. Boyd.
Champion	Gay Lass 5	Gay Lass 5.
Reserve	Miss Brae 40	Valencia 3.
Aged Herd	1. Clifford	Chapman.
	2. M. Boyd	Clifford.
CLASS.		
Aged Bulls	1. Refner, Clifford	REGINA (Summer). Refner, Clifford.
	2. Excellence Son, Morson Boyd	Excellence Son M., Boyd.
Bulls, 2 years	1. Beau Albion, J. D. Chapman	Beau Albion, Chapman.
	2. Hugh Hill, J. D. Chapman	
Bulls, 1 year	1. Bonnie Brae 49, Clifford	Bullion 4, M. Boyd.
	2.	Bonnie Brae 49, Clifford.
Bulls, Jr. yearlings	1. Bullion 4, M. Boyd	
	2. Bonnie Brae 42, Clifford	
Senior Calf	1. Clifford	Clifford.
	2. Clifford	Clifford.
Junior Calf	1. Clifford	Clifford.
	2. Chapman	Chapman.
Champion	Refner	Refner.
Reserve	Bullion 4	Bullion 4.
Aged Cows	Gay Lass 5, Chapman	Gay Lass 5, Chapman
	2. Miss Brae 26, Clifford	Miss Brae 26, Clifford.
Heifer, 2 years	1. Virgil Lass, Chapman	Bella, Chapman.
	2. Valencia 3rd, M. Boyd	Valencia 3rd, M. Boyd.
Heifer, Sr. yearlings	1. Miss Brae 40, Clifford	Miss Brae 40, Clifford.
	2. Fair Vic, Chapman	Fair Vic, Chapman.
Heifer, Jr. yearlings	1. Clifford	
	2. Chapman	
Heifer, Sr. Calf	1. Clifford	Clifford.
	2. Clifford	Chapman.
Heifer, Jr. Calf	1. Clifford	Clifford.
	2. M. Boyd	M. Boyd.

Champion	Gay Lass 5	1. Refner, L. O. Clifford	1. Refner, L. O. Clifford	1. Refner, L. O. Clifford	1. Refner, L. O. Clifford
Aged Herd	Clifford	2. Bonnie Brae 21, H. D. Smith	2. Bonnie Brae 21, H. D. Smith	2. Bonnie Brae 21, H. D. Smith	2. Bonnie Brae 21, H. D. Smith
	Chapman	1. Bonnie Brae, Mrs. Hunter	1. Bonnie Brae, Mrs. Hunter	1. Bonnie Brae, Mrs. Hunter	1. Bonnie Brae, Mrs. Hunter
		2.	2.	2.	2.
		1. Brae Ingleside, H. D. Smith	1. Brae Ingleside, H. D. Smith	1. Brae Ingleside, H. D. Smith	1. Brae Ingleside, H. D. Smith
		2.	2.	2.	2.
		1. Bonnie Brae 62, L. O. Clifford	1. Bonnie Brae 62, L. O. Clifford	1. Bonnie Brae 62, L. O. Clifford	1. Bonnie Brae 62, L. O. Clifford
		2. Roxie Lad, Mrs. Hunter	2. Roxie Lad, Mrs. Hunter	2. Roxie Lad, Mrs. Hunter	2. Roxie Lad, Mrs. Hunter
		1. Lord Fairfax, L. O. Clifford	1. Lord Fairfax, L. O. Clifford	1. Lord Fairfax, L. O. Clifford	1. Lord Fairfax, L. O. Clifford
		2. Commander, Mrs. Hunter	2. Commander, Mrs. Hunter	2. Commander, Mrs. Hunter	2. Commander, Mrs. Hunter
		Refner	Refner	Refner	Refner
		1. Miss Brae 26, L. O. Clifford	1. Miss Brae 26, L. O. Clifford	1. Miss Brae 26, L. O. Clifford	1. Miss Brae 26, L. O. Clifford
		2. Rubella 17, Smith	2. Rubella 17, Smith	2. Rubella 17, Smith	2. Rubella 17, Smith
		1. Rubella 23, Smith	1. Rubella 23, Smith	1. Rubella 23, Smith	1. Rubella 23, Smith
		2. Miss Brae 34, Clifford	2. Miss Brae 34, Clifford	2. Miss Brae 34, Clifford	2. Miss Brae 34, Clifford
		1. Miss Brae 40, Clifford	1. Miss Brae 40, Clifford	1. Miss Brae 40, Clifford	1. Miss Brae 40, Clifford
		2. Rubella 33, Smith	2. Rubella 33, Smith	2. Rubella 33, Smith	2. Rubella 33, Smith
		1. Fleta Fairfax, Clifford	1. Fleta Fairfax, Clifford	1. Fleta Fairfax, Clifford	1. Fleta Fairfax, Clifford
		2. Lady Blanche 10, J. Page	2. Lady Blanche 10, J. Page	2. Lady Blanche 10, J. Page	2. Lady Blanche 10, J. Page
		1.	1.	1.	1.
		2.	2.	2.	2.
		1. May Queen, Clifford	1. May Queen, Clifford	1. May Queen, Clifford	1. May Queen, Clifford
		2. Laura 35, Smith	2. Laura 35, Smith	2. Laura 35, Smith	2. Laura 35, Smith
		Miss Brae 26	Miss Brae 26	Miss Brae 26	Miss Brae 26
		Fleta Fairfax	Fleta Fairfax	Fleta Fairfax	Fleta Fairfax
		1. L. O. Clifford	1. L. O. Clifford	1. L. O. Clifford	1. L. O. Clifford
		2. H. D. Smith	2. H. D. Smith	2. H. D. Smith	2. H. D. Smith
		1. Clifford	1. Clifford	1. Clifford	1. Clifford
		2. Mrs. Hunter	2. Mrs. Hunter	2. Mrs. Hunter	2. Mrs. Hunter
		1. Prince A. Mercena, A. E. Hulet	1. Prince A. Mercena, A. E. Hulet	1. Prince A. Mercena, A. E. Hulet	1. Prince A. Mercena, A. E. Hulet
		2. P. H. P. Korndyke, N. Sangster	2. P. H. P. Korndyke, N. Sangster	2. P. H. P. Korndyke, N. Sangster	2. P. H. P. Korndyke, N. Sangster
		1. Homestead A. Prince, A. L. Stackhouse	1. Homestead A. Prince, A. L. Stackhouse	1. Homestead A. Prince, A. L. Stackhouse	1. Homestead A. Prince, A. L. Stackhouse
		2. A. E. Hulet	2. A. E. Hulet	2. A. E. Hulet	2. A. E. Hulet

CLASS.

NATIONAL SHOW.

CANADIAN NATIONAL.

CLASS.

OTTAWA.

LONDON WESTERN.

Gay Lass 5.

Clifford.

Chapman.

Bonnie Brae 21, H. D. Smith.
Refner, L. O. Clifford.

Bonnie Brae 45, Clifford.

Clifford.

Clifford.

Hunter.

Clifford.

Bonnie Brae 21.

Miss Brae 26, Clifford.

Princess 7, Clifford.

Rubella Ingleside, Smith.

Princess Victoria, Hunter.

Miss Brae 45, Clifford.

Rubella 1. 33, Smith.

Fleta Princess, Clifford.

Lady Blanche, Clifford.

Clifford.

Hunter.

Clifford.

Miss Brae 26.

Clifford.

Smith.

Clifford.

Clifford.

1. Bonnie Brae 21st, H. D. Smith

2. Refner, L. O. Clifford

1. O'Neill Bros.

Bulls, 1 year	1. Ruben A. Mercena, A. E. Hulet	1. Bonnie Brae 49, Clifford
Bulls, Sr. Calf	2. Colony F. Ry Apple, R. Hall	2. Bannie Brae 52, Smith
Bulls, Jr. Calf	1. Hulet	1. Clifford
Champion	2. Hulet	2. Clifford
Dry Cows	1. Gordon Gooderham	1. Clifford
Aged Cows	2. W. J. Parnell	2. O'Neill Bros.
Heifer, 3 years	1. Prince Abberkirk Mercena	1. Bonnie Brae 21
Heifer, 2 years	1. Woodlawn Queen, Hulet	
Heifer, 2 years, dry	2. Arletissa 2nd, Gooderham	
Heifer, Sr. yearlings	1. Queen DeKol Posch, Gooderham	1. Miss Brae 26, Clifford
Heifer, Jr. yearlings	2. Polly Martin, F. S. Caldwell	2. Rubella Ingleside, Smith
Heifer, Sr. Calf	1. Roda's Q. Princess, Sangster	
Heifer, Jr. Calf	2. Senista Rue Dot, J. McKillican	
Champion	1. Countess A. Mercena, A. E. Hulet	1. Ruby Ingleside, Smith
Aged Herd	2. Netheral P. Korndyke, W. C. Stevens	2. Miss Brae 34, Clifford
Jr. Herd	1. Lilla of P. V., Sangster	
	2. Thelma, Gordon Gooderham	
	1. Lady P. Colantha, Hulet	1. Miss Brae 35, Clifford
	2. J. DeKol Butter Cup, Stevens	2. Fleta Fairfax, Clifford
	1. Sangster	
	2. Hulet	
	1. Hulet	1. Miss Brae 38, Clifford
	2. Stevens	2. May Queen, Clifford
	1. Hulet	1. Clifford
	2. R. C. Holby	2. O'Neill Bros.
	Woodlawn Queen	Miss Brae 26
	1. Hulet	1. Clifford
	2. Sangster	
	1. Sangster	
	2. Stevens	

Holsteins

CLASS.

LONDON WESTERN.

CALGARY (Summer).

Agad Bulls	1. Count H. F. DeKol, E. F. Osler	Sir Pietertje of Riverside, Michener Bros.
Bulls, 2 years	2. Logan P. Schulling, Tig Wood	Sir Admiral Ormsby 8nd, Carlyle Bros.
	1. Sir Homewood Payne, Chas. Pearce	Korndyke Hungerveld Beauty, Lacock.
	2. Major Posch Mercena, A. E. Hulet	Ridian Bells Calamity, Lacock.

Bulls, 1 year	1. R. J. Kelly	Lacock.
Bulls, Jr. yearlings	2. P. K. Schuling, Tig Wood	C. P. R. Demonstration Farm.
Bulls, Jr. Calf	1. A. E. Hulet	W. J. Hunt.
Champion	2. R. J. Kelly	W. J. Hunt.
Aged Cows	1. Chas. Pearce	Lacock.
Cows, 3 years	2. E. F. Osler	W. J. Tregellus.
Heifer, 2 years	Count Hungerveld Fayne DeKol	Sir Pieterjtje of Riverside.
Heifer, 1 year	1. Cherryvale Winner, Osler	Hilda Wayne Johanna, Michener Bros.
Heifer, Jr. yearlings	2. Pauline C. Tensen, Hulet	Butter Jewel, Lacock.
Heifer, Sr. Calf	1. Glenin, R. J. Kelly	Maida Abberkirk, Lacock.
Heifer, Jr. Calf	2. Houtjtje C. Posch, R. J. Kelly	Pauline Abino DeKol, Carlyle Bros.
Champion	1.	Bonheur Thorogood, Michener Bros.
Aged Herd	2.	Vronkas Pride DeKol, Lacock.
Jr. Herd	1. Ladoga V. Mercena, Hulet	Kilkenny DeKol Girl, W. Nelson.
	2. Princess M. Ackum, Pearce	J. Lacock.
	1.	C. P. R.
	2.	Carlyle Bros.
	1. Hulet	Carlyle Bros.
	2. Pearce	Atkins Bros.
	1. Pearce	Hilda Wayne Johanna.
	2. Kelly	
Champion	Cherry Vale Winner	
Aged Herd	1. R. J. Kelly	
	2. Hulet	
	1. A. E. Hulet	
	2. R. J. Kelly	

CLASS.

NATIONAL SHOW.

CANADIAN NATIONAL.

Aged Bulls	1. Lord Cornelius, City Dairy	Prince A. Mercena, A. E. Hulet.
Bulls, 2 years	2. Pontiac H. C. Paul, E. Snyder	Prince M. DeKol, Gordon Gooderham.
Bulls, 1 year	1. Homewood Colantha, P. Canary	Woodlawn S. S., A. E. Hulet.
Bulls, Sr. Calf	2.	Sir H. Fayne, Chas. Pearce.
Bulls, Jr. Calf	1. Sir Belle Fayne, Haley Bros.	Reuben A. Mercena, A. E. Hulet.
Champion	2. Segis DeKol, Sir H. Pellatt	Segis De Kol, Sir H. Pellatt.
	1. Cornella DeKol, City Dairy	P. C. Abberkirk, A. E. Hulet.
	2. Sir Paul A. Mercena, A. E. Hulet	King L. H. Segis, R. F. Heicks.
	1. Potter Prince, City Dairy	King S. P. Posch, Gooderham.
	2. Mercena Natoye, J. Kilgour	Paul M. Wayne, K. R. Marshall.
	Homewood Colantha	Prince Abberkirk.

Manor Farm Holsteins

Type and Production are Equal Considerations



HERD SIRE: King Segis Pontiac Posch. SIRE: King Segis Pontiac Alcarta

The above sire is sired by the famous \$10,000.00 bull, King Segis Pontiac Alcarta, and is the only bull in Canada whose dam holds a World's Record. In addition to his World's Record ancestors, he is an individual of almost perfect type. At Toronto C. N. E. and at Ottawa Summer Fair, 1913, the only twice shown, he was made Junior Champion of the breed. This young sire was secured from one of the most famous herds in the United States for the special purpose of breeding to the young daughters of my senior herd bull, Prince Hengerveld of the Pontiacs. Bull calves bred for type and production can always be found at Manor Farm at moderate prices.

Gordon S. Gooderham

Phone Toronto North 3936

BEDFORD PARK, ONT.

Bulls, Jr. Calf	1. Harding	Lacock.
Grand Champion	2. Hancox	Logan & Robertson.
Aged Cows	Prince Hungerveld Pieterje	Count Canary Mercena Posch.
	1. Belle Tensen, Hardy	Logan & Robertson.
	2. Logan & Robertson	Mercena of Riverside, Mischener Bros.
Cows, 3 years	1. O. T. DeKol, Hardy	
	2. Sarah Hungerveld, Hardy	
Heifer, 2 years	1. P. H. Lennox, Hardy	Logan & Robertson.
	2. Wooderest Pieterje, Hardy	Lacock.
Heifer, Sr. yearlings	1. Lady W. Pieterje, Hardy	Logan & Robertson.
	2. Crystal Pieterje, Hardy	Logan & Robertson.
Heifer, Sr. Calf	1. P. P. Arrtes, Hardy	Logan & Robertson.
	2. Veronka Pieterje, Hardy	R. J. Mills.
Heifer, Jr. Calf	1. Cummings	
	2. Cummings	
Champion	Bell Tensen	Logan & Robertson.
Reserve	P. H. Lenox	
Aged Herd	1. Hardy	
	2. Logan & Robertson	
Jr. Herd	1. Hardy	
	2. Hardy	
CLASS		
Aged Bulls	SASKATOON (SUMMER).	
	1. Lord Albino, Logan & Robertson	Logan & Robertson.
	2. Stanley Count Posch, do	Logan & Robertson.
Bulls, 2 years	1. C. P. DeKol, Campbell	Sir Bell Pieterje, A. B. Potter.
Bulls, Sr. yearlings	1. Logan & Robertson	
Bulls, Jr. yearlings	1. Logan & Robertson	
Bulls, Sr. Calf	2.	Logan & Robertson.
	1.	Hancox.
Bulls, Jr. Calf	2.	Potter.
	1. Lord Albino	Logan & Robertson.
Grand Champion		Sir Bell Pieterje.
Reserve	1. Jacoba Johana, Logan & Robertson ..	Logan & Robertson.
Aged Cows	2. Vilstra Triumph, Hancox	Logan & Robertson.
	1. Logan & Robertson	Logan & Robertson.
Heifer, 2 years	2. Logan & Robertson	Logan & Robertson.
Heifer, Sr. yearlings	1. Logan & Robertson	Logan & Robertson.
	2. Logan & Robertson	Logan & Robertson.

REGINA (SUMMER).

Logan & Robertson.
 Logan & Robertson.
 Sir Bell Pieterje, A. B. Potter.

Logan & Robertson.
 Hancox.
 Potter.

Logan & Robertson.
 Sir Bell Pieterje.
 Logan & Robertson.
 Logan & Robertson.
 Logan & Robertson.
 Logan & Robertson.
 Logan & Robertson.

Heifer, Jr. yearlings	1.	Logan & Robertson	Logan & Robertson.
Heifer, Sr. Calf	1.	Logan & Robertson	Logan & Robertson.
Heifer, Jr. Calf	2.	Hancox	Hancox.
Heifer, Jr. Calf	1.	Logan & Robertson	Logan & Robertson.
Champion	2.	Hancox	Potter.
Aged Herd	1.	Jacoba Johana	Logan & Robertson.
		Logan & Robertson	
CLASS			
Aged Bulls	1.	N. Sangster	Schulling Sir Posch, Harding Bros.
Bulls, 2 years	2.	J. Harvey	Lee & Clark.
Bulls, 1 year	1.	L. Archambault	Lee & Clark.
Bulls, Sr. yearlings	2.	R. Parker	Harding Bros.
		J. J. Alexander	
Bulls, Jr. yearlings	1.		Lee & Clark.
Bulls, Sr. Calf	1.	J. L. Riches	Harding Bros.
Bulls, Jr. Calf	2.	L. Archambault	Lee & Clark.
		J. L. Riches	
Champion	2.	W. J. Parnell	Schulling Sir Posch.
Aged Cows	1.	N. Sangster	Madolyn D. KeKol, Harding Bros.
Aged Cows, dry	2.	N. Sangster	Lee & Clark.
		N. Sangster	Harding Bros.
Heifer, 3 years	1.		Lee & Clark.
Heifer, 2 years	2.	J. J. Alexander	Lee & Clark.
Heifer, 2 years, dry	1.	J. L. Riches	Lee & Clark.
Heifer, 1 year	2.	R. Beauregard	Lee & Clark.
Heifer, Sr. yearlings	1.	N. Sangster	
Heifer, Jr. yearlings	2.	N. Sangster	
Heifer, Sr. Calf	1.	N. Sangster	
		N. Sangster	
		L. Archambault	

CLASS.		Ayrshires	
		CANADIAN NATIONAL.	
Heifer, Jr. Calf	1. N. Sangster	1. N. Sangster	Madolyn D. DeKol.
Champion	2. N. Sangster	2. N. Sangster	Harding Bros.
Aged Herd	1. N. Sangster	1. N. Sangster	Lee & Clark.
Junior Herd	2. J. L. Riches	2. J. L. Riches	Harding Bros.
		NATIONAL SHOW.	
Aged Bulls	1. Hobsland's Masterpiece, R. R. Ness ..	1. Lessnessock F. King, A. S. Turner.	
Bulls, 2 years	2. Auchenbrain Hercules, A. Hume	2. Spring Hill Cashier, W. Stewart.	
Bulls 1 year	1. Burnside L. Cavalier, Ness	1. Helen's Monarch, H. C. Hammil.	
Senior Calf	2. White Duke, A. Hume	2. White Duke, A. Hume.	
Junior Calf	1. Hobsland's Sunrise, Ness	1. Crowbar Boy, W. Stewart.	
Champion	2. Heather Lee, Stewart	2. Duke of Wardend, F. H. Harris.	
Aged Cows	1. Burnside Bess, Ness	1. Humeshaugh King, A. Hume.	
Heifer, 3 years	2. Dainty Davy, Stewart	2. Captain of S., Turner.	
Heifer, 2 years	1. Hobsland's Masterpiece	1. Silver King, Turner.	
Heifer, Sr. yearlings	2. Auchenbrain Fanny 9th, Ness	2. White Bob, Stewart.	
Heifer, Jr. yearlings	1. Beuchen Spottie 4, Ness	1. Michener Bros.	
Heifer, Sr. Calf	2. Finlayson Maggie, Ness	2. Clarkland Kate 2nd, Hume.	
Heifer, Jr. Calf	1. Barcheskie White B., Ness	1. Jessie, Turner.	
Champion	2. Burnside Dina, Ness	2. White Lass, J. L. Stansell.	
Aged Herd	1. Spicy Ena, Hume	1. Dairy Maid of H. H., N. Dymont.	
Junior Herd	2. Humeshaugh Kate, Hume	2. Spicy Lass, Hume.	
	1. Burnside Dina 3rd, Ness	1. Hazel, F. H. Harris.	
	2. Holehouse Randy 9, Ness	2. White Rose 3rd, Turner.	
	1. White Heather 3rd, Stewart	1. Humeshaugh Kate, Hume.	
	2. Blue Belle, Stewart	2. Duchess of H., Harris.	
	1. Spicy Kate, Hume	1. White Heather 3rd, Stewart.	
	2. Betty of Menie, Stewart	2. Lady Floss, Turner.	
	1. Silver Belle, Ness	1. Doreen, Turner.	
	2. Auchenbrain Fanny 9	2. Valentine, Harris.	
	1. Ness	1. Humeshaugh Rose 2, Hume.	
	2. Stewart	2. Clarkland Kate 2.	
		1. White Rose 3.	
		2. Hume.	
		1. Breeder's Herd, Turner.	

OLASS.**OTTAWA (FALL).****LONDON (WESTERN).**

Aged Bulls	1. Hobland's Masterpiece, Ness	Lessnessock F. King, Turner.
Bulls, 2 years	2. Netheral Sir Douglas, J. W. Logan ..	Auchenbrain Hercules, A. Hume.
Bulls, 1 year	1. Burnsire Cavalier, Ness	White Duke of Springbank, Hume.
Bulls, Sr. Calf	2. Senator Owens	Netheral King, Turner.
Bulls, Jr. Calf	1. Sunny Imp. Chief, Logan	Sprightly Hercules, Hume.
Champion	2. Hobland's Sunrise, Ness	Royal Victor, Turner.
Aged Cows	1. Prince Arthur, Ness	Heather Lee, Stewart.
Dry Cows	2. Johnson 2nd, D. McFarlane	White King, Turner.
Heifer, 3 years	1. R. R. Ness	
Heifer, 2 years	2. Senator Owens	
Heifer, 1 year	1. Hobland's Masterpiece	Lessnessock F. King.
Heifer, Sr. Calf	2. Auchenbrain Fanny 9, Ness	Clarkland Kate 2nd, Hume.
Heifer, Jr. yearlings	1. Bloomhill, Flora, Ness	Lassie, Hume.
Heifer, Jr. Calf	2. Barcheskie, W. B., Ness	
Champion	1. Finlayson Maggie, Ness	Betsy Brown, Turner.
Aged Herd	2.	Kate of Menie, Hume.
	1. Burnsire Maggie, Ness	Spring Ena, Hume.
	2. C. B. Lena, P. D. McArthur	Whitehill Rose 3rd, Turner.
	1. Holehouse Randy 9, Ness	Lady Floss, Turner.
	2. Dairy Queen, D. McFarlane	Humeshaugh Kate, Hume.
	1. Ness	
	2. Ness	
	1.	Queen Floss, Turner.
	2.	Blue Belle of Menie, Stewart.
	1. D. McFarlane	
	2. Senator Owens	
	1. Auchenbrain Fanny 9	Clarkland Kate 2.
	2. R. R. Ness	Hume.
	1. R. R. Ness	Turner.
	2.	
	1. Hobland's Masterpiece, R. R. Ness ..	REGINA (SUMMER).
	2. Morton Mains Sensier, Rowland Ness ..	Hobland's Masterpiece, Ness.
	1. Burnsire Lucky Cavalier, R. R. Ness ..	M. M. Planet, R. Ness.
	2. Silver Prince, W. J. Mortson	Burnside Lucky Cavalier, Ness.
	1. Hobland's Charm, R. R. Ness	Silver Prince, W. J. Mortson.
	2.	Burnside R. Warrant, R. Ness.
	1.	R. R. Ness.
	2.	A. P. Hammond.

OLASS.**SASKATOON (SUMMER).**

Bulls, Sr. Calf	1. Lake View King, R. R. Ness	R. Ness.
Bulls, Jr. Calf	2. W. J. Mortson	W. J. Mortson.
Grand Champion	1.	R. Ness.
Aged Cows	2.	R. R. Ness.
Heifer, 2 years	Hobland's Masterpiece	Hobland's Masterpiece.
Heifer, Sr. yearlings	Bloomhill Flora, R. R. Ness	Bloomhill Flora, R. R. Ness.
Heifer, Jr. yearlings	2. Bunch, R. R. Ness	B. Tena, R. Ness.
Heifer, Sr. Calf	1. Hobland's Barbara, R. R. Ness	Hobland's Barbara, R. R. Ness.
Heifer, Jr. Calf	2. H. Queen Mary, R. R. Ness	Lakeside Clara, R. Ness.
Grand Champion	1. Lakeside Mull, R. Ness	Adeliah, R. R. Ness.
Reserve	2. Burnside Adeliah, R. R. Ness	Lakeside Mull, R. Ness.
Aged Herd	1. Holehouse Randy 9, R. R. Ness	Holehouse Randy 9, R. R. Ness.
	2. Mirile, Mortson	Mirile, Mortson.
	1. R. R. Ness	R. R. Ness.
	2. R. R. Ness	R. Ness.
	1.	R. Ness.
	2.	R. R. Ness.
	Bloomhill Flora	Bloomhill Flora.
	Holehouse Randy 9	
	1. R. R. Ness	R. R. Ness.
	2. R. Ness	R. Ness.

CLASS.

DOMINION, BRANDON.

EDMONTON (SUMMER).

Aged Bulls	1. Hobland's Masterpiece, R. R. Ness	Hobland's Masterpiece, Ness.
Bulls, 2 years	2. M. Main Sensier, R. Ness	Morton Mains Planet, R. Ness.
Bulls, 1 year	1. Gay Cavalier, R. R. Ness	Royal Cavalier, R. R. Ness.
Bulls, Jr. Yr.	2. Hobland's Choice, R. R. Ness	Silver Prince, W. J. Mortson.
Bulls, Sr. Calf	1. B. R. Warrant, R. Ness	B. S. Warrant, R. Ness.
Bulls, Jr. Calf	2.	Hobland's Charm, R. R. Ness.
Champion	1. Lakeview Laddie, R. Ness	Woodland's Glentonia, J. J. Richards.
Reserve	2. B. S. Spearmint, R. R. Ness	B. S. Spearmint, R. R. Ness.
Aged Cows	1. R. Ness	Laddie, Sir Netherall, J. J. Richards.
	2. R. Ness	
	Hobland's Masterpiece	Hobland's Masterpiece.
	Gay Cavalier	
	Bloomhill Flora, R. R. Ness	Bloomhill Flora, R. R. Ness.
	2. Burnside Lena, R. Ness	Burnside Tina, R. Ness.

CLASS.		CAIGARY (SUMMER).		SHERBROOKE.	
Heifer, 3 years	1. Burnside Clara, R. Ness	1. Morton Mains Sensier, R. Ness	Bell Boy, Senator Owens.		
	2. Auchentleigh C., R. R. Ness	2. Netherall Douglas Swell, J. J. Richards	Netherall Sir Douglas, J. J. Richards.		
Heifer, 2 years	1. Hobsland's Barbara, R. R. Ness	1. Admiral Ball d'Urf, R. Ness	D. T. Ness.		
	2. Hillhouse Q. Mary, R. R. Ness	2. Silver Prince, W. J. Mortson	R. Parker.		
Heifer, 1 year	1. Holehouse Randy, R. R. Ness	1. Morton Mains Sensier, R. Ness	Jno. W. Logan.		
	2. Burnside Adalia, R. R. Ness	2. (Only Entry)	P. D. McArthur.		
Heifer, Sr. yearlings	1. Morton Mains Sensier, R. Ness	1. Woodland's Glentomie, J. J. Richards.	Senator Owens.		
	2. Hobsland's Barbara	2. Lakeview Swell, R. Ness	D. T. Ness.		
Heifer, Jr. yearlings	1. R. R. Ness	1. J. J. Richards	P. D. McArthur.		
	2. R. Ness	2. R. Ness	Senator Owens.		
Heifer, Sr. Calf	1. Morton Mains Sensier	1. Morton Mains Sensier	Bell Boy.		
	2. Ravensdale Countess, R. Ness	2. Ravensdale Countess, R. Ness	Jno. W. Logan.		
Heifer, Jr. Calf	1. Burnside Lady Nora 2nd, J. Richards	1. Burnside Clara 12th, R. Ness	D. T. Ness.		
	2. Burnside Clara 12th, R. Ness	2. Homewood Cindrella, J. J. Richards.	P. D. McArthur.		
Heifer, 3 years, dry	1. Burnside Clara 12th, R. Ness		D. T. Ness.		
	2. Homewood Cindrella, J. J. Richards.		Senator Owens.		
Heifer, 3 years	1. Burnside Clara 12th, R. Ness		D. T. Ness.		
	2. Homewood Cindrella, J. J. Richards.		Senator Owens.		

Heifer, 2 years	1. Lakeside Clara, R. Ness	P. D. McArthur.
Heifer, 2 years, dry	2. White Rose of Lone Spruce, R. Ness ..	P. D. McArthur.
Heifer, Sr. yearlings	1.	D. T. Ness.
Heifer, Jr. yearlings	2.	Jno. W. Logan.
Heifer, Sr. Calf	1. Lakeside Silver Belle, J. J. Richards..	Senator Owens.
Heifer, Jr. Calf	2. Lakeside C. 3rd, R. Ness	R. Parker.
Champion	1. R. Ness	
Sr. Herd	2. J. J. Richards	
Jr. Herd	1.	Ant. Phaneuf.
	2.	D. T. Ness.
	1.	Senator Owens.
	2.	Senator Owens.
	1. Ravensdale Countess	Morton Mains Belle, Jno. W. Logan.
	2. Ness	P. D. McArthur.
	1. Richards	Senator Owens.
	2.	Senator Owens.
	1.	Jno. W. Logan.
	2.	

CLASS.

HALIFAX.

Aged Bulls	1. McIntyre Bros.	
Bulls, 2 years	1. McRae & Sons	
Bulls, Sr. yearlings	1. McRae & Sons	
Bulls, Jr. yearlings	1. McIntyre Bros.	
Bulls, Sr. Calf	1. McIntyre Bros.	
Champion	McIntyre Bros.	
JERSEYS AT CANADIAN NATIONAL.		
Aged Bull	1. Sultan's Raleigh	B. H. Bull & Son.
Bulls, 2 years	2. Syras Raleigh	Sir Wm. McKenzie.
Bulls, 1 year	1. Calandar	Sir Wm. McKenzie.
Bull, Sr. Calf	2. B. Raleigh Duke	B. H. Bull & Son.
Bull, Jr. Calf	1. Brampton Stockwell	Wm. McEachren.
Champion	2. Clyptha's Majesty	Sir Wm. McKenzie.
Aged Cows	1. B. Golden Noble	B. H. Bull & Son.
	2. B. Ferns Noble	B. H. Bull & Son.
	1. B. Stockwell John	B. H. Bull & Son.
	2. B. Karnack Chief	B. H. Bull & Son.
	1. Sultan's Raleigh	
	2. Twylish	Sir Wm. McKenzie.
	1.	B. H. Bull & Son.
	2. B. Raleigh Noblesse	

Cows, 3 years	1. B. Lady Alice	B. H. Bull & Son.
	2. B. Wonder Beauty	B. H. Bull & Son.
Cows, 3 years (Dry)	1. Brampton Othello	B. H. Bull & Son.
Champion	Twylsh	



Sultan's Baleigh, Champion Jersey Bull, Canadian National, 1913.

THREE DAYS' DAIRY TEST AT GUELPH.

	Milk.	% Fat.	Total Pts.
Short-horns—Cow 48 months and over:			
Bessie of Lowbanks the 2nd, F. Martindale & Son, York	153.6	3.5	178.1
Gipsy Lady the 2nd, Estate of A. W. Smith, Maple Lodge	122.1	4.1	153.9
White Rose, Jas. Brown, Norval	118.5	2.9	117.7
Cow 36 months and under 48:			
Kentucky Rose 49th, Jas. Brown	113.8	4.4	160.9
Heifer under 36 months:			
Lady Breamar, Jas. Brown	83.2	4.05	110.5
Ayrshires—Cow 48 months and over:			
White Floss, A. S. Turner & Son, Ryckman's Corners	168.2	4.3	227.3
Annie Hume, H. C. Hamill, Box Grove	154.7	4.4	214.4
Briery 2nd of Springbank, A. S. Turner & Son	178.4	3.55	213.6
Lady Lena of Fairfield, Reginald J. A. Smith, Hatchley Sta.	151.3	4.05	197.5
Jessie, A. S. Turner & Son	140.3	3.6	165.8
Cow 36 months and under 48:			
White Lass, J. L. Stansell, Straffordville	154.2	4.15	204.67
Craigielea Jean, H. C. Hamill, Box Grove	146.5	4.4	203.3
Pansy of Springbank, A. S. Turner & Son	151.7	4.1	199.6
Starlight of Fairfield, Reginald J. A. Smith, Hatsom Sta.	144.9	4.05	189.1
Betsey Brown, A. F. Turner & Son	135.8	4.15	187.7
Dairy Maid, N. Dymont, Dundas	121.6	4.2	171.79
Dutchess, N. Dymont	123.9	4.4	169.2
Heifer under 36 months:			
Craigielea Peach, H. C. Hamill, Box Grove...	143.9	4.1	188.6
Whitehill Whiterose 3rd, S. Turner & Son...	91.0	3.9	122.2
Jean Armour of Fairfield, Reginald A. J. Smith	92.3	4.0	119.2
Fairy of Hickory, N. Dymont	103.9	3.3	116.4
Holsteins—Cow 48 months and over:			
Calamity Posch Wayne 3rd, Tig Wood, Mitchell	225.9	4.05	288.1
Snowflake, H. F. Patterson, Paris	229.4	3.5	264.5
Ladoga Idaline Verman, A. E. Hulet, Norwich	208.7	3.85	259.5
Netherland Beauty Poche, W. H. Cherry, Garnet	224.8	3.4	252.6
Calamity Houwtje, Martin, McDowell	211.8	3.45	240.2
Brehta, H. F. Patterson, Paris	249.7	2.75	237.6
Lady Glanthus de Kol, Martin McDowell	200.3	3.35	224.0
Candlemass Queen, Martin, McDowell	184.5	3.7	222.9
Schuling 7th, Pieterje, C. C. Kettle, Wilsonville	191.8	3.4	215.6
Netherland Aggie Bell, Wilbert C. Prouse, Tillsonburg	203.2	2.95	202.6
Aaltje Canary Posch, L. H. Lipsit, Straffordville	180.	3.35	200.6
Pieterje Hengerveld Bell, L. H. Lipsit, Straffordville	168.1	3.01	168.5
Cow 36 months and under 48:			
Pontiac Jessie, Martin McDowell, Woodstock	185.7	3.8	227.8
Elmdale Maid, W. Lemon, Lynden	184.7	3.65	218.0
Queen Sigis Ormsby, A. C. Hallman, Breslau.	188.1	3.35	210.1
Pontiac Atlas Pauline, Martin McDowell	181.3	3.4	205.7
Della Schuiling de Kol, T. H. Dent, Wood-			

stock	166.2	3.8	203.7
Countess Maud Posch, Clarence Kettle, ¹⁹²³⁻¹¹ sonville	177.2	3.05	183.9
Inez Rosy, Veeman, L. H. Lipsit	163.8	3.25	177.4
Maple Grove Sadie, O. & W. O. Palmer, St. Sebastiene, Que.	141.1	3.4	158.6
Heifer under 36 months:			
Netherland Beauty, Posch's Fafont, W. H. Cherry, Garnet	181.4	3.95	232.1
Madam Pauline Canary, A. E. Hulet, Norwich	164.5	4.1	214.5
Schulling Maid Girl, Tig. Wood, Mitchell	184.6	3.45	212.4
Bessie Spink Mercena, T. W. McQueen, Till- sonburg	144.3	4.1	189.1
Countess Mercena Wayne, T. W. McQueen...	160.8	3.5	184.5
Inka Mercedes, O. & W. O. Palmer	142.0	3.25	159.1
Jerseys—Cow 48 months and over:			
Maid of Dentonia, D. A. Boyle, Woodstock...	116.9	4.5	171.6
Rena d'Or's Tiny, Wm. Jas. Beatty, Guelph..	65.6	5.85	122.5
Cow 36 months and under 48:			
Brampton Wonder Beauty, B. H. Bull & Son, Brampton	108.3	4.1	151.9
Brampton Czarina, B. H. Bull & Son	96.8	4.95	149.06
Rena's Cobalt, Wm. Jas. Beatty, Guelph	84.1	5.3	146.53
Heifer under 36 months:			
Springbank Buttergirl, T. H. Dent, Woodstock	125.9	4.25	171.0
You'll Do Queen, B. H. Bull & Son, Brampton	107.2	5.15	169.57
Beauty Maid, D. A. Boyle, Woodstock	97.5	5.1	155.4
Brampton Bright Lass, B. H. Bull & Son.....	88.4	5.7	154.12
Brampton Bright Betty, B. H. Bull & Sons...	80.6	5.65	144.11
Brampton Bright Kathleen, B. H. Bull & Son.	104.6	4.2	143.09
Mokena's Best, Wm. Jas. Beatty, Guelph	78.2	5.2	135.82
Grades—Cow 48 months and over:			
Pine Grove Bell, Willis Bros., Pine Grove....	247.2	2.65	229.6
Sadie, Geo. B. Ryan, Courtland	201.5	3.4	227.4
Cow 36 months and under 48:			
Beauty, Geo. B. Ryan, Courtland	216.9	3.6	256.0
Heifer under 36 months:			
Daisy, Geo. B. Ryan, Courtland	170.9	3.95	214.9
Madge, Wm. Jas. Beatty, Guelph	86.4	4.35	129.4

DAIRY TEST AT OTTAWA.

	Milk.	% Fat.	Total Pts.
Ayrshires—Cow 48 months and over:			
White Floss, A. S. Turner, Ryckman's Corners	161.18	3.8	198.48
Briery, 2nd of Springbank, A. S. Turner	163.	3.4	193.8
Barcheskie Viola, R. Meharey, Russell.....	137.6	4.1	178.78
Barcheskie Helen, R. Meharey	135.	4.0	169.78
Cow 36 months and under 48:			
Betsy Brown, A. S. Turner	130.7	4.3	1.85
Pansey of Springbank, A. S. Turner	138.3	3.4	1056.05
Valley Pride, R. Meharey	119.9	3.6	132.24
Heifer under 36 months:			
1.—A. S. Turner	137.4	3.5	155.25
2.—A. S. Turner .....	.....	...	.....
3.—A. S. Turner .....	.....	...	.....
Holsteins—Cow, 48 months and over:			
Daisy Posch, W. J. Bailey, Nober	215.1	3.1	259.09
Hilda of Nober, W. J. Bailey	203.5	3.3	249.95
Cassie Dekol Wayne, E. Baker, Winchester..	247.8	2.9	240.49
White Lily, R. Holtby, Manchester	225.4	3.	227.08
Cow 36 months and under 48:			

Mary Segis Beets, Dr. Hardwood, Vaudreuil..	192.7	3.2	205.37
Korndyke, Queen DeKol, Dr. Hardwood	177.	3.4	195.75
Lady Carman, Pontiac, Dr. Hardwood .....	.....	...	.....
Heifer 24 months and under 36:			
Cassie DeKol Zeeman, R. Dowler	175.3	3.3	188.41
Countess Posch, W. J. Bailey	183.3	3.	181.63
Minnie Connor DeKol, E. Baker	181.9	2.8	174.36
Heifer under 34 months:			
Ideal Daisy FAVORIT, W. J. Bailey	147.4	3.8	180.98
Fancy Dutchland, Hengerveld, R. M. Holtby.	129.2	4.	169.90
Hengerveld FAVORIT, W. J. Bailey	151.5	3.2	159.08
Shorthorns —Cow 48 months or over:			
Lady Morning Glory II., A. H. Foster, Richmond	93.1	3.8	117.82
Cow 36 months and over 48:			
Primrose Maid, S. Bray, Beathton	108.08	4.5	161.51
Lady Morning Glory III., A. H. Foster	108.01	3.3	121.21
Heifer under 36 months:			
_____, S. Bray	76.6	3.2	82.02
Grade cow 48 months or over:			
_____, T. A. Spratt	176.7	3.8	213.96
Grade cow 36 months and under:			
_____, T. A. Spratt	200.05	3.5	229.9

NATIONAL SHOW TEST.

	Milk.	% Fat.	Total Pts.
Holsteins —Aged cows:			
Madam B., W. F. Walker, Manchester, Ont...	213.2	3.5	243.34
Netherland Schinshy, W. J. Bigger & Sons, Erie, Ont.	220.9	3.3	241.55
Ladoga Idaline's Veeman, E. A. Hulet, Norwich ..	195.5	3.5	227.61
_____, Leuszler & Bollert, Bright, Ont.	196.5	3.4	220.37
Three-year class:			
Nettie Abbekirk, M. H. Haley, Springford....	166.6	3.9	207.29
Jemima Boucheur, A. E. Hulet	145.5	3.3	157.35
Under three years:			
Grace Colantha Posch, M. H. Haley	142.7	3.8	173.77
Corea Fairmount Hortoize, M. H. Haley	168.8	2.8	160.67
_____, Leuszler & Bollert	119.8	3.9	151.13
Grade Cows four-year class:			
_____, Willis Bros., Pine Grove, Ont...	227.5	2.7	212.92
Ayrshires —Four-year class:			
Briery 2nd of Springbank, A. S. Turner & Son, Ryckman's Corners, Ont.	185.8	3.4	211.45
Jessie, A. S. Turner & Son	176.5	3.7	210.65
_____, Wm. Stewart & Sons, Menie, Ont.	113.6	4.2	155.64
_____, Alexander Hume, Menie	120.1	3.6	148.17
Three-year old class:			
White Lass, J. L. Stansell, Straffordville....	134.9	4.6	192.46
Betsy Brown, A. S. Turner & Son	135.5	4.	178.08
_____, N. Dymont, Dundas, Ont.	121.5	3.9	161.99
Under three years:			
Fairy, N. Dymont, Dundas	110.6	4.	141.95
Spray Lass, Alex. Hume, Menie	107.	4.	136.93
_____, Frank M. Harris, Mt. Elgin....	105.7	3.6	125.60
Jerseys —Four-year class:			
Lida, J. B. Cowieson & Sons, Queensville....	87.7	5.6	140.59
Three-year class:			
Wonder Beauty, B. H. Bull & Son, Brampton.	107.7	4.4	156.30
Czarina, B. H. Bull & Son, Brampton	91.9	5.3	147.40
Heifer under 36 months:			
Bright Lass, B. H. Bull & Son	101.3	4.2	135.97
Mokena's Best, J. B. Cowieson & Son	88.4	4.9	140.65
_____, B. H. Bull & Son	97.	4.7	141.

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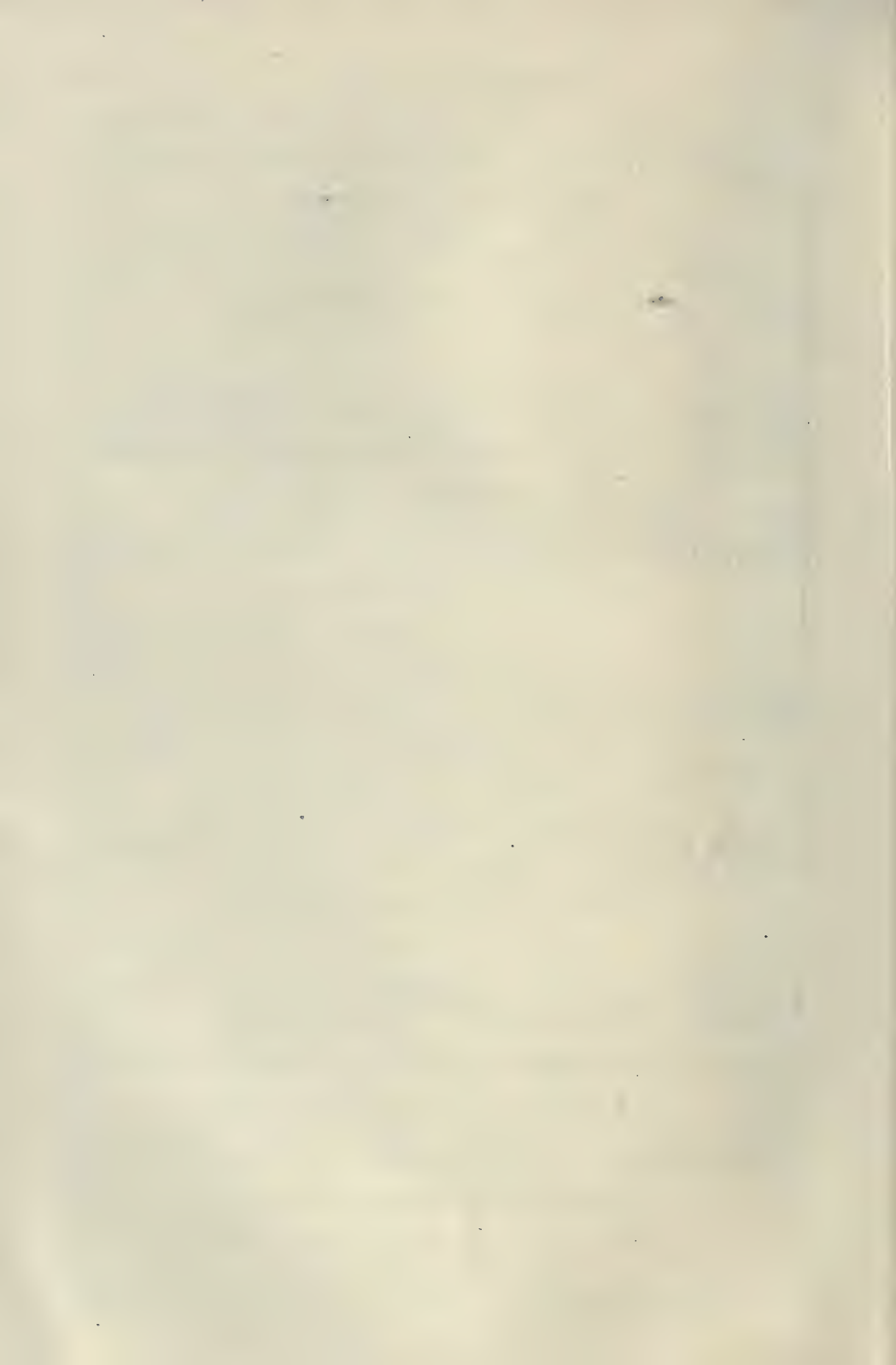
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Dominion Department of Agriculture Bulletins.

The Dominion bulletins may be obtained by applying to Dominion Dept. of Agriculture, Ottawa. No charge.

Creamery Cold Storage.

The Inspection and Sale Act, Part IV., as amended in 1907-8. (The Fruit Marks Act and Fruit Packages). Revised Edition.

Cow Testing Associations, with Some Notes on the Sampling and Testing of Milk.

Sweet Cream Butter.

Apparatus for the Determination of Fat and Water in Butter.

Buttermaking on the Farm.

The Use of Ice on the Farm.

The Cooling of Milk for Cheese-making.

Cold Storage and the Cold Storage Act.

The Dairying Industry in Canada.

Notes for Factory Cheesemakers.
Cream Cheese.

A List of the Cheese Factories, Creameries and Condensed Milk Plants in Canada.

The Care of Cream for Butter-making.

Co-operation in Fruit Growing.

Modern Methods of Packing Apples and Pears.

Small Cold Storage, etc.

Results of Experiments with early, medium and late Sowings of Grain.

Weeds.

Barnyard Manure.

Production of Bacon for the British market.

Sheep Husbandry in Canada.

Beef Raising in Canada.

Horsebreeding and Rearing.

Care of Market Eggs.

ERRATA.

Page 10.—Under "Line of Draft." Fifth line should read "cut 81," not page 81.

Page 14.—Conclusion of "How to Find Growing Season" should read: equals 27 days=27 days before May 15th=April 18th.

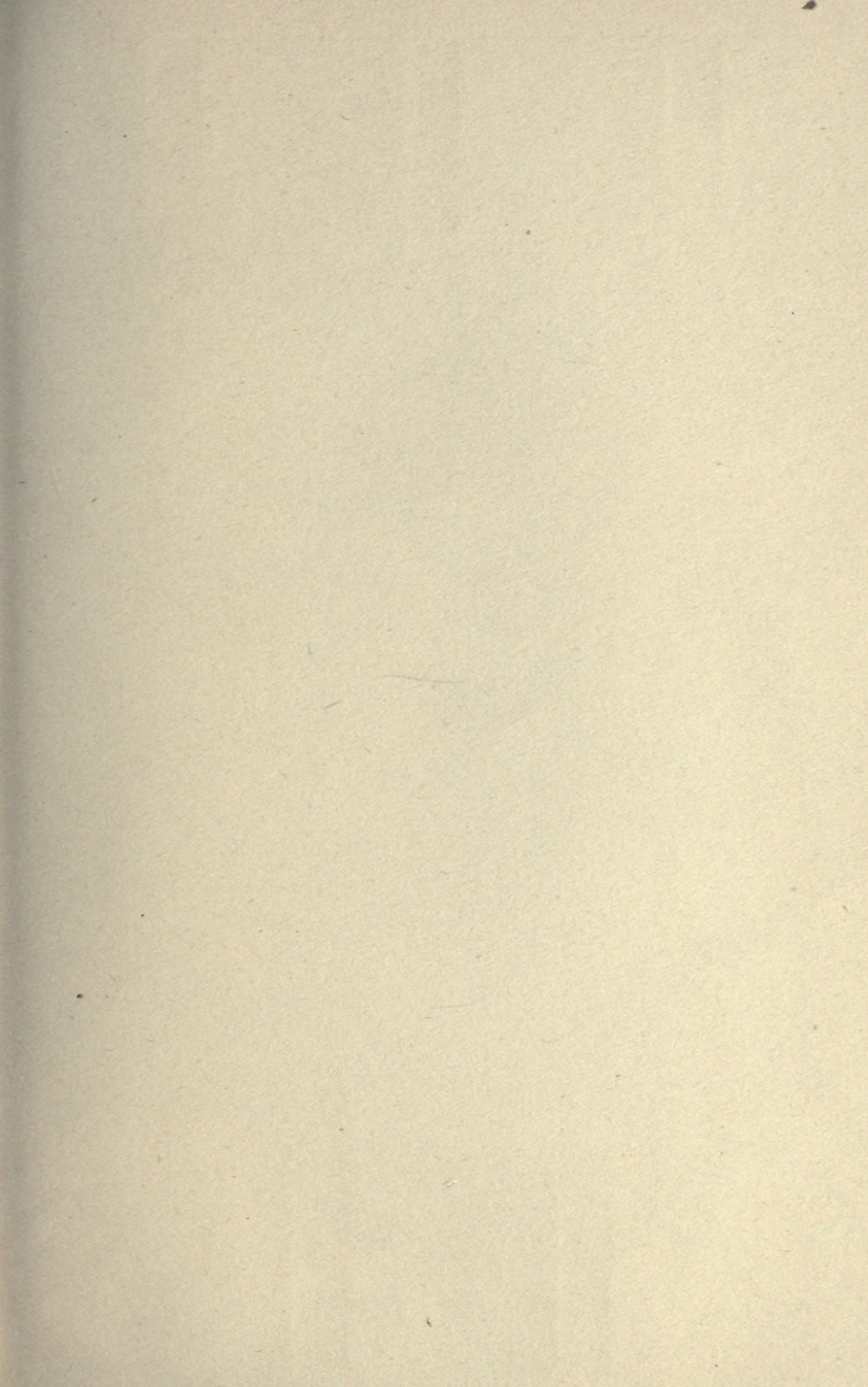
Page 25.—First line of page should read "The tables on page 18."

Page 37.—States in line 9, "Figure 2," and in line 24, "Fig. 3 shows them." Both these illustrations were mislaid and do not appear.

Page 70.—"h" should read: "injury due to beetle."

Page 119.—Under Fees for Registration of Imported Animals: The fees to members are under the wrong column for "Males recorded within 30 days" and for males if not recorded in 30 days.

Page 179.—First line should read "Allow at least 4 to 6 square feet."



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GRAIN GROWERS' RESOLUTION.

At the annual convention of the Manitoba Grain Growers' Association, in Brandon, January 17th, 18th and 19th, the following resolution was passed:

"Believing in the Direct-from-Factory Policy of the Sarnia Fence Company, and the independent stand in the interest of the farmers of Western Canada and realizing the saving that has come to those that have been taking advantage of the direct prices; and believing that by the co-operation of the Grain Growers' Associations, it would be possible for the Company to still further lower prices; be it therefore resolved, that the members of the Grain Growers' Association, met in convention, purchase as far as possible their entire requirements in wire, from the Sarnia Fence Company."—A. D. McConnell, F. Parker.

DOMINION GRANGE RESOLUTION.

At the annual convention of the Dominion Grange, held in Victoria Hall, Toronto, on December nineteenth, the following resolution was unanimously passed:

"That the representatives there, advise their local Granges to give every assistance possible to The Sarnia Fence Company and to purchase Sarnia Fence in preference to all other Fence."

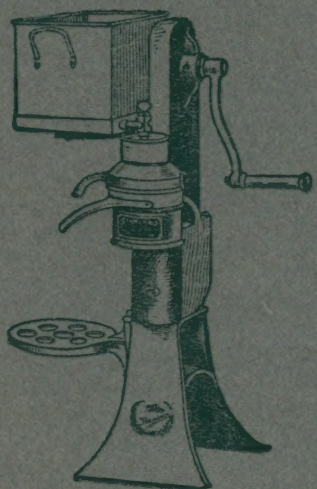
Resolutions have also been passed by the Manitoba Grain Growers' Association, Saskatchewan Grain Growers' Association, and United Farmers' Association, favoring the Sarnia Fence Co. co-operative plan.

Read the resolutions of these two representative organizations and then send in the names of the members of your own local association and we will fully explain our co-operative plan

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